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A Theory of Threat and Defense

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The writings of Maslow [4, 5], Rosenzweig [8], Rogers [7], Snygg and Combs [10] have in recent years emphasized the concept of threat. The phenomenon of threat, while it has been of general popular and psychological significance for many years, is being viewed more and more as essential in accounting for the psychology of maladjustment.

The theory proposed in this paper is an attempt to explore threat in two directions. It is designed to propose an explanation of threat in terms of a systematic theory of personality. It is formulated in specific terms to foster objective investigation of threat and defense.

The theory of personality is a derivation and expansion of that proposed by Rogers [7]. More particularly, it is related to that view of self and behavior which emphasized the concept of self and its structural properties [6].

An investigation of the measurement of the amount of defensiveness exhibited by clients in counseling stimulated the development of the theory. In another paper, the writer has presented the method of measuring client defensiveness in terms of the theory [3].

Theory of Self and Behavior

A question that persists when one attempts rigorously to devise a conception of threat comes when the question is asked, threat to what? Current literature reflects conceptions of threat to the self, to the ego, to the integration of the self, to the security of the self, and so forth. This question, however, points up the need for a theory which might explain what the self is. Accordingly, the theory of threat to be presented is based upon a theory of self and behavior which may in briefest outline be presented as follows:

The self is defined as the organism experiencing relations with the environment. Within the first few years of life, the organism as a functioning unit becomes differentiated from the other units in the behavioral field. Self becomes, then, a frame of reference emphasizing the experiencing organism as a unit in the behavioral field.

Behavior is the result of the individual's attempts to reformulate his tension system adequately. Needs and emotions function as a system of tensions, which at a given moment is characterized by relative balance and imbalance. Imbalance in this tension system urges activity. Activity is an attempt to balance the tension system by increasing or reducing tensions to a subjectively defined state of satisfaction.

The individual attempts to reformulate his tension system in the behavioral field as he perceives it. His perceptions constitute his reality. In the course of interaction, conflicts arise—conflicts of goals, methods of interaction, expected rewards and punishments. Also varying bases of interpretation develop—different frames of reference for investing sensations with symbolic and affective connotations. An individual learns the consequences of different bases of interpretation and the effects of different choices at conflict points. Those that more adequately resolve the tension system, he tends to retain as acceptable; those that less adequately resolve the tension system, he tends to retain as unacceptable.

There are three important categories of perceptual data which determine the form of behavior in a given field. They are the individual's perception of the self's relation to the particular field, the capacities of the self in the field, and the desirability of various ways of behaving in the field. The individual's perception of self defines the nature of self and

the field. His perception of his capacities defines the possible ways in which he can behave. His value system defines the appropriate way of behaving from among the possible ways of behaving. These perceptions are learned as suggested above.

A variety of such perceptions become abstracted and symbolized as self-definitions and evaluations. Numerous such self-definitions and evaluations arise, are confirmed, rejected, and altered in the life history of the individual. Those which have functionally persisted may be called the structure of the self—that picture of self which is carried around for ready reference. The structure of the self is the preferred frame of reference. It becomes a guide to interaction, designed to provide an orderly, predictable picture of life and behavior which is relied upon for adequate tension reformulation.

The structure of self is thus important motivationally. Since it is the platform for adequate tension reformulation, it can become important in its own right. Behavior inconsistent with this organization of concepts and values disturbs feelings that develop about the self. Behavior inconsistent with conceptions of self and environment questions the predictability of life, causing insecurity. Feelings of inadequacy result when performance does not match the self's conception of its ability. Worthlessness and guilt arise when behavior abrogates cherished values. These feelings of insecurity, inadequacy, and worthlessness—experienced varieties of anxiety—amount to imbalances in the tension system which must be resolved. There thus develops a need to maintain and enhance the self through behavior consistent with the structure of the self.

Any experienced change in the nature of self and the environment, the capacities of the self, and its insight into values places a pressure on the structure of the self. There are essentially two ways in which the individual may react: by changing his experiences to fit the structure of self, or by changing the structure of self to fit experience. Persistence in behavior consistent with older conceptions of self may foster a spurious balance in feelings of security, adequacy, and worth; clinging to the familiar and preferred is soothing. This process is here termed defense. But such action seldom satisfies all the new pressures set up by change in the tension system. Awareness of change and difference, together with an incorporation of the new perceptions in the structure of the self, does resolve new tensions as well as establish a firmer base for the self's adequacy, security, and worth. Continuing redefinition and re-evaluations of the self with changing experience lead to a continuously revised structure of self which is more reliable in predicting and guiding behavior which adequately reformulates the tension system. This process may be described as self-realization or self-actualization.

Theory of Threat

With this theory of the self and behavior in mind the theory of threat can be proposed. Threat occurs when the self perceives its experiences as being inconsistent with the structure of the self. In other words, when threat is spoken of, what is meant is threat to a related concept or value. In the first therapeutic interview with a student-client, Miss Ban [11], the following statements which she makes illustrate the concept of threat. Her fourth statement in the interview went like this:

> (Statement 4, first interview): No, I don't stack up and I'm cognizant of the fact that I'm in greater competition now than I've ever been before because of the caliber of the students here and I realized that before I came and I've taken that into consideration and I still feel that my capacities aren't being—that I'm not learning what I should be and how much I should be.

A few statements later she says:

> (Statement 12, first interview): I mean as one of my ideals I want social work very much, and if I'm not going to be a good social worker because of my own personal difficulties then I don't want to be one: I mean there is so much built up around social work as a symbol but . . . well . . . life isn't very interesting after that point, so I'm concerned.

In the fourth statement Miss Ban expresses a threat to a concept of capacity. She says: "I still feel that my capacities aren't being—I'm not learning what I should be and how much I should be." Here, on the one hand, is a particular level of performance as defined by Miss Ban, and on the other hand, the experience of not living up to this definition of capacity. In

the twelfth statement Miss Ban evidences threat to one of her values. She says: "I mean as one of my ideals I want social work very much; and if I'm not going to be a good social worker because of my personal difficulties then I don't want to be one." In other words, her lack of academic performance is inconsistent with her ideal of being a social worker and thus threatens this value. Her expression of concern in these statements can be explained in somewhat the following way. First, a value, that of social work, is being threatened by lack of performance in the academic world. This is a threat to the value and disturbs whatever tensions it is designed to reduce. Secondly, the low performance she is experiencing threatens her concept of her capacity and disturbs the needs and feelings related to this concept. Thus she is threatened both with relation to her self-definition and her self-evaluation.

A few characteristics of threat may now be noted. First, that which is threatened is, basically, the individual's perception of his ability adequately to reformulate his tension system. At different levels of theoretical importance or interest one may speak of threat to concepts and values, threat to the self, threat to the security, adequacy, or worth of the self, or threat to its need satisfaction. All these expressions are accurate within the theory of self and behavior that has been presented. At the behavioral level the concepts and values in the structure of the self provide the background against which experiences are related to be interpreted as threatening or nonthreatening. Because the self is that which is defined by concepts and values, threat may be accurately conceived as occurring to the self. Since concepts and values are designed to guide behavior in meeting needs, threat may be spoken of in relation to adequate need satisfaction. Since lack of prediction and control foster insecurity, inadequacy, and worthlessness, unpredictable and uncontrollable experience increases these feelings, threatening the self's security, adequacy, and worth.

Second, threat is felt as perceived by the self; it is essentially phenomenological. Threat is felt when the incongruence is perceived, irrespective of what may be the nature of the situation as perceived by others or from other points of view. Thus a boy experiences an error in bridge as evidence of his incompetence, whereas another may shrug it off. A girl may view an affair with a boy as jeopardizing her work toward a career, whereas another will see it as evidence of her popularity. It is the interpretation of the experience from the accepted frame of reference that determines which experiences are threatening and which are not.

Third, the disturbance occasioned by threat requires that the individual do something to resolve the threat. Threat is a motivating factor of prime importance.

Fourth, there are essentially two reactions to such a threat; the individual may revise his concepts or values, and perhaps the attendant tensions, to include the new and different experience; in this way he would change his structure of self so that it was more consistent with his continuing experience. Also, the individual may deny or in some way distort the inconsistent experience in such a way so that he may see himself in the accustomed way. The first reaction is termed an accepting reaction in that it involves the admission of all relevant perceptions and the making of necessary revisions in concepts and values so that they are more consistent with one's total experience and more adequate to reformulate the tension system. The second reaction is termed the defensive reaction in that it involves the maintenance and enhancement of the self through clinging to familiar concepts and values of the self in the face of experiences which challenge them.

Theory of Defense

Defense is defined as a sequence of behavior in response to threat, the goal of which is the maintenance of the structure of the self against the threat. The characteristics of defense may be illustrated by excerpts from the case of a client, Mr. Lew [12]. Mr. Lew defined himself as a shy, rather socially maladjusted person. Others saw him quite differently, which was threatening to him. In discussing this area, he said:

> . . . my dad, for instance, (says) you've got personality, you've got looks, and then gives me good advice. Well, it irks me for the simple reason that the personality people perceive is not my person-

ality and for that reason it irks me because *it isn't true*—what they're saying, only they don't know what they're talking about, and of course I can't explain it to them, it's impossible.

The attitudes of others toward Mr. Lew are inconsistent with his concept of himself. This threat instigates the defense of denying the perceptions of others and maintaining his own concept of self.

From this illustration, the characteristics of defensive behavior may be differentiated.

First, defense is a response to threat. The inconsistent perceptions of Mr. Lew and others challenge his conception of self and disturb his security. This feeling disturbance activates behavior to restore feelings of security.

Second, the purpose of defense is to maintain or enhance the self as perceived. From among the possible ways of re-establishing his security, Mr. Lew chose to support his current conception of self. He acted to continue perceiving himself as shy and unsociable.

Third, defense involves a denial or distortion of the offending experience. Mr. Lew vehemently denied the assertions of others concerning his personality.

Fourth, defense reduces the awareness of threat, but not the threat itself. By convincing himself the statements of others were untrue, Mr. Lew restored his shaken security. By discounting their veracity, he reduced the concern they gave him. But he did not resolve the threat; people still saw him as personable and good-looking. Nor did he preclude further threats; in the future, when others perceive him in this fashion, he will be threatened again.

Fifth, defense requires further defense. Mr. Lew was not content merely to deny others' perceptions, he had to justify his denial by saying people really don't see him as he is, that people don't know what they're talking about. Each of these justifications is in itself a distortion, which will require further defense if challenged. In effect, defense further widens the area of distorted perceptions within the self which must be defended.

Levels of Defense

Since defense does not resolve threat, but merely reduces awareness of threat, each defense is subject to further threat. Threat then is followed by defense and further threat. This sequence tends to continue until challenges cease or the threat is resolved. In effect, as the self organizes its perceptions more in terms of defense, layer after layer of defense is built up around threatened areas. Defense is echeloned in depth, maintaining the sensitive area against experience, and the resulting conative-cognitive organization can be discussed in terms of levels of defense. As each level of defense is threatened, another level is added to strengthen the defense.

The sequence of threat and defense and the resulting levels of defense are well illustrated in the case of Miss Ban. In this case, the areas of marriage and a career were two threatened areas. In order to understand Miss Ban's perception of these areas, her expressions from various portions of the case are presented.

(Statement 246, fourth interview): . . . In fact, I mean—this is very pertinent—in that although I realized that a fellow-girl relationship with me would be very good for my entire emotional self, I think it would do a quite—very—a great deal for me, I fear it completely, and that's no good; I mean, I shouldn't. I mean, it's very normal, I mean, normal desire for girls to desire fellows and vice versa, and yet I think I'm beginning to fear it—in—I think it ultimately might prove detrimental to my entire personality. I fear it because the other experience, the *entire* relationship after a certain point was *so* disheartening. And as I said I think it was a very traumatic thing in my life. It was completely disheartening. But I mean every time I think of another relationship with a fellow, even with this nice fellow, I know, I figure, Oh, what's the use, and, uh. . . .

This material from the fourth interview—near the peak of catharsis, reveals the basic threat to the self, which is diagrammed below:

(1) *Structure of Self*
". . . I realized that a fellow-girl relationship would be very good for my entire emotional self . . . "

(2) *Threatening experience*
". . . the other experience (with a fellow), the entire relationship after a certain point was so disheartening . . . a very traumatic thing . . . "

This threat was so great a blow to her emotional security, that Miss Ban, as will be seen below, reorganized the basis of her security so as to avoid "fellow-girl" relationships:

(3) *Revised structure of self*
Fellow-girl relationships are disheartening

The revised structure of self, in itself a defense, omitted the perceived desires for such relationships, and these kept threatening the self, requiring defense.

(3) *Threatening experience*
Fellow-girl relationships are disheartening

(4) *Threatening experience*
". . . everytime I think of another relationship with a fellow, even with this nice fellow (another one) . . . "

(5) *Defense of self against threat*
" . . . I think, 'Oh, what's the use,' and, uh . . ."

In further defense of this and other areas of self, Miss Ban decided upon a career: social work. The following excerpt from the first interview indicates what this structure of self has come to mean and how it is threatened.

(Statement 12, first interview): . . . I mean, this is perhaps more critical than—in my growth process— than any other time in the past. I mean, so you either go this way, or this way—the wrong way or the right way—in learning, and in your philosophy of life and in your adjustment in general. I mean, being in social work your personal life, as you know, is so tied up with your work—with your ultimate work—that—I feel that if I'm not completely happy, and if I'm not completely satisfied, then I'm not going to do well—a good job. And I ——that's a conflict, I know. I mean as one of my ideals I want social work very much, and if I'm not going to be a good social worker because of my own personal difficulties—then I don't want to be one. I mean if I don't want to be a social worker—I mean, there is so much built up around social work as a symbol. But well, life isn't very interesting after that point. So, I'm concerned.

Miss Ban finds her ideal of social work threatened by "personal difficulties," which include social maladjustment and low academic scholarship. Yet the basic threat outlined above, however well defended, is at the root of the maladjustment. This is brought out clearly in a few statements from the second interview which follow.

Miss Ban (Statement 83, second interview):[1] And the other factor of my make-up, personality . . . vocationally, I am not worried, too. *I think I've settled the conflict of . . . that most girls go through of marriage and career.*"

[1]Italics mine.

Counselor (84): "You have pretty well settled that for yourself."

Miss Ban (84): "Yeah. Quite well. I mean, as well as I can. *I've thought it through carefully. I mean, I read on it and talked on it, and I think I. . . .* "

Counselor (85): "You've thought a lot about this. . . . "

Miss Ban (85): "I think I was disturbed about that when I was about seventeen or eighteen, I mean, when I had to make the decision. I mean, in my thinking I had to make a decision, and I was disturbed about it. I think it's resolved itself."

Counselor (86): "At the time you had to make the decision it was a little hard to make, but now you are pretty well satisfied with the way things are in that area."

Miss Ban (86): "Yeah. *I mean, I don't know if I have a wholesome attitude of philosophizing, which is not perhaps wholesome,* but in a sense. . . . I mean, *I am able to philosophize about things and about situations.* I mean, about marriage and about men and possibilities and all. And . . . *oh, I mean, you worry about it,* I guess, occasionally. *Most young men and women, I guess, would tend to worry about it,* but that. . . . "

Counselor (87): "It comes up occasionally and . . . . "

Miss Ban (87): "Yeah, *it does occasionally. And when I was feeling real low a couple of months ago . . . Of course everything would bother you when you are feeling low.* I mean, every other problem bothered me too—*but now it's not bothering me. Now the main thing that seems to be bothering me is this adjustment to school, and so on. And this well, the loneliness doesn't bother me on the surface as much now as the schooling. It's the main thing.*"

This discussion illustrates the sequential nature of threat and defense which is diagrammatically presented below:

(1) *Structure of self*
" . . . I realize that a fellow-girl relationship would be very good for my entire emotional self. . . . " (246)

(2) *Threatening experience*
" . . . the other experience (with a fellow), the entire relationship after a certain point was so disheartening . . . a very traumatic thing. . . . "(246)

(3) *Revised structure of self*
Fellow-girl relationships are disheartening. . . " . . . I want social work very much. . . . " (246)

(4) *Threatening experience*
" . . . every time I think of another relationship with a fellow, even with this nice fellow (another one). . . . " (246)

(5) *Defense of self*
" . . . I think, 'Oh, what's the use,' and uh. . . . " (246) "I think I've settled the conflict of . . . that

most girls go through of marriage and career." (83)

(6) *Threatening experience*
Awareness that conflict is not completely settled, just "as well as I can" (84)

(7) *Further level of defense*
"I've thought it through carefully. I mean, I read on it and talked on it. . . . " (84)

(8) *Threatening experience*
" . . . I don't know if I have a wholesome attitude of philosophizing, which is not perhaps wholesome. . . . " (86)

(9) *Further level of defense*
" . . . I am able to philosophize about things and situations." (86)

(10) *Threatening experience*
" . . . oh, I mean, you worry about it. . . . " (86)

(11) *Further level of defense*
"Most young men and women, I guess, would tend to worry about it. . . . " (86)

(12) *Threatening experience*
" . . . it does (come up) occasionally. And when I was feeling real low a couple of months ago. . . ." (87)

(13) *Further level of defense*
". . . of course, everything would bother you when you are feeling low" (87)

(14) *Threatening experience*
- - - loneliness - - - (87)

(15) *Further level of defense*
" . . . but, now it's not bothering me. Now the main thing that seems to be bothering me is this adjustment to school, and so on. And this, well, this loneliness doesn't bother me on the surface as much now as the schooling. It's the main thing." (87)

Miss Ban perceives the conflict as settled. She has it settled, not "pretty well" or "quite well," but "as well as I can." Evidently her continuing experience in the area causes her to doubt and be threatened by the consideration that it might not be definitely settled. She has thus talked about it, read on it, and philosophized to the point where her perception of it as conflictual and disturbing is justified. Nevertheless, she doubts the "wholesomeness" of philosophizing and does worry about (is still threatened by) the conflict. That this is not serious she rationalizes by viewing it as something that everyone does. Then she implies she worries a great deal about it, but she sees it as something which is not the main worry, the latter being school. She then proceeds to discuss the problems relating to school.

It will be noted throughout this sequence that the threat somehow would not be covered up, no matter how many reasons, platitudes and values, were brought to defense. The final defense was complete withdrawal of discussion to a less threatened area.

Implications of the Theory

The theory of threat emphasizes the importance of the conceptual level of oganization in behavior. In effect, needs become less crucial in the explanation of behavior. More and more significance is attached to the particular interpretation placed on needs by the self and the methods and goals held by the self as necessary for need satisfaction.

In light of this emphasis, certain problems arise. This magnified emphasis on conceptual organization runs counter to the equally significant implication of the theory that adjustment involves a continuous revision of the conceptual organization in light of adequate need satisfaction and continuing experience. Also, the evidence seems to suggest that extreme threat can cause a breakdown of the structure of self to provide need satisfaction under extreme conditions [9]. Each of the latter considerations points up the relatively greater importance of needs in the determination of behavior. This position must be questioned in view of tendencies toward suicide and self-sacrifice which appear as behavior in terms of conceptual organization rather than need satisfaction [6]. One issue presented by this evidence is that of the conditions under which the conceptual organization becomes inflexible and unresponsive to new conditions of need satisfaction (maladjustment). Another issue is the conditions under which the conceptual organization determines behavior which requires or promises need deprivation (heroism, etc.).

The theory proposes one way of resolving these issues by making a distinction between the basic needs and the needs for security, adequacy, and worth. Behavior directives based upon learnings from experience with basic need satisfaction cannot lead to maladjustment; conceptual organization representing a logical extension of these learnings tends to be reliable because satisfying and consistent with experience. Concern for self, however, motivates the individual to find a *sure* base for living, a *definite* notion of capacity, an *unas-*

sailable standard of worth. The former approach looks to continuing experience with a "what's going to happen?"; the latter, with a "this *has* to happen?" Thus the self-concerned individual, organizing more and more of experience in terms of prior patterns, becomes maladjusted through denial and distortion of more and more experience. The suicide lives in reverse, dispatching himself consistent with his feeling of worthlessness, inadequacy, or insecurity. The hero (with qualms from the inevitable uncertainty of situations) behaves deftly as questions of value and capacity are settled surely and certainly because based on all experience and continuously satisfying. The martyr, on the other hand, may deprive or frustrate needs to recoup the feeling of worth or adequacy he has lost.

Such an emphasis on conceptual organization appears to call for a revision of psychopathological theory. Rosenzweig [8] has suggested a differentiation of reactions to frustation into need-persistive and ego-defensive categories. The need-persistive reaction "serves to fulfill the frustrated need in spite of momentary obstructions. . ."; ego-defensive reactions "serve to protect the integration of the personality, if and when the latter is threatened by the frustrating situation." "Most behavior incident to frustration entails both types of reaction but pure cases of each alone are found and the theoretical distinction between the two appears justified as an aid to analysis." The distinction is between need deprivation and threat to self. The implication is that in some situations needs dominate behavior and in others, behavior is dominated by the conceptual organization of the self. Such a distinction raises a question concerning the conditions under which self-involvement does and does not occur. Also, it requires an accounting of the conditions under which threat to the self will be followed by defense or acceptance. The present theory suggests that self-involvement occurs when some value or concept becomes relevant to some experience. Self-involvement could occur without threat if the self is identified with its experience rather than being primarily self-concerned. Self-involvement with threat requires experience related to self-structure predicated on the maintenance of security, adequacy, or worth. Self-involvement with threat induces defense when behavior is directed at preserving matters of self-concern rather than finding a more effective measure of need satisfaction. The opposite of the latter process—self-involvement without threat—is seen in successful psychotherapy.

Undoubtedly tension is heightened by frustration, threat, or some combination of both. Yet the relative pathologic importance of the two is still in question. Is it need deprivation or threat to the self or some combination which is fundamentally pathological? Maslow, in his brief review of the concepts of frustration and conflict, concludes:

> We may then proceed to a reclassification of our concepts in the general field of psychopathogenesis. We may speak first of deprivation and, secondly, of choice and consider them both to be nonpathogenic and, therefore, unimportant concepts for the student of psychopathology. The one concept that is important is neither conflict nor frustration but the essential pathogenic characteristic of both—namely, threat of thwarting of the basic needs of the organism.
>
> . . . we may expand the above statement to read "danger to the basic needs or the necessary conditions upon which they rest for the individual." If we had the space, this would involve a discussion not only of specifically individual defense mechanisms, e.g., identifying keeping a job with masculinity, but also broader conditions like freedom to speak, to complain, to be ambitious, to move away, to determine one's own fate. We may summarize by saying that, in general, all the following are felt as threatening in our sense; danger of thwarting of the basic needs, or the conditions upon which they rest, threat to life itself, threat to the general integrity of the organism, threat to the integration of the organism, and threat to the organism's basic mastery of the world [5, p. 82].

At the root of threat, to be sure, lies the possible thwarting of needs. Yet, if need satisfaction were of prime importance in maladjustment, need-persistive reactions would usually predominate; and occasions when they did to the detriment of cherished values would be viewed with less concern. Yet the conditions established for need satisfaction seem predominant in maladjustment. The individual is absorbed with defending his system of defenses. It appears that deprivation involving threat and not deprivation alone is responsible for maladjustment.

As Maslow suggests, no theory of threat is complete unless it provides an understanding

of possible reactions to threat. In light of the present theory, these are essentially two. First, the individual may accept the threatening experience. This may be done by an admission of the total experience and consequent reorganization of the structure of the self. This appears outside the realm of possibility from the standpoint of Freudian psychology [1], in which personality is viewed in terms of more or less adequate defense systems. Such a view would imply each behavior pattern is motivated to an extent by anxiety and none solely by other needs; such an inclusive implication strains the facts of everyday living, though perhaps not the facts of neurosis and psychosis. Secondly, an individual may respond to threat by defense. Defense involves a denial or distortion of experience. Defense can include a denial of experience to permit behavior consistent with the structure of the self and a denial of experience to perceive behavior in terms of the structure of the self.

The implications for mental hygiene are numerous. The values of self-determination for growth and adjustment seem clearly superior to those of introjection. The necessity of basing learning on all relevant aspects of the tension system rather than only upon the peculiarly susceptible self-feelings of insecurity, inadequacy, and worthlessness seems apparent. Also, the need for developing behavior-directing concepts and values on the basis of all relevant experience is indicated for the construction of the reliable self. Finally, a searching for and resolution of threat, rather than a defense of that which is threatened, leads to self-actualization.

Among possible research implications, a few will be mentioned. Varying levels of defense may well indicate areas of varying sensitivity to threat within the self. An investigation of this relationship could well reveal the soundness and the usefulness of the theory. The concepts of threat and defense might well be utilized as criteria for adjustment and maladjustment. Haigh's study applying these concepts to psychotherapeutic-interview protocols tends to confirm such an hypothesis [2]. The theory appears useful in level of aspiration studies, in the analysis of comments of subjects performing below their set levels of aspiration. In another paper, the writer has reported the development and evaluation of a method of analyzing interviews for client defensiveness [3].

Summary

A theory of threat and defense has been presented in terms of a theory of self-emphasizing cognitive determinants of behavior. Threat is understood as occurring when experience is perceived as inconsistent with learned conceptions and evaluations of self. Defense is conceived as a response to threat maintaining the self as conceived by denying or distorting the threatening experience. A defensive reaction reduces awareness of threat but does not resolve the threat. The self and its defense are susceptible to further threat. Threat and defense thus follow one another in successive levels. Implications of the theory for maladjustment, mental hygiene, and research have been briefly indicated.

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Stress Reduction and Problem-Solving Rigidity[1]

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Problem-solving rigidity, defined as the tendency to adhere to an induced method of problem solution which ceases to represent the most direct and efficient method of solving the problem under consideration [6], has been studied recently by means of the Luchins water-jar technique [11]. Data from several independent sources [3, 5, 8, 11, 13] has led to the generalization that such rigid behavior tends to increase in a generally monotonic fashion as a function of increasing psychological stress. Beier [2] has succeeded in demonstrating that rigidity, defined as decrease in abstract ability, increases as a result of anxiety induced through interpretation of a Rorschach record.

Elsewhere workers have suggested that the type of rigid behavior studied in the present experiment may be maladaptive. Thus Klee [10] states "behavior is abnormal when it persists in a situation where it is no longer appropriate," while Alexander [1] notes that "the first requirement of industrial civilization is a highly flexible and adaptable personality." Research verification of this point of view is offered by Cowen and Thompson [6] and Fisher [7] who report significant correlations between rigidity and maladjustment.

If we may assume that this type of rigid behavior represents, under certain specified experimental conditions, a paradigm of maladaptive behavior, the problem of how we may reduce or extinguish it becomes one of considerable importance to personality theory as well as to clinical therapeutic practice. The present study attempts, in an exploratory way, to examine the effects of reduction of induced stress perception on the reduction of problem-solving rigidity.

Procedure[2]

One hundred and fifty-seven college students were asked to serve as a "standardization group" for a new projective device, the Lævy Movement Test [14], which was given to them in group administration. Volunteers were requested in the event that further testing would be necessary. After *S*s indicated a willingness to be tested further, they were informed that their projective-test records were to be evaluated by a group of clinicians, and that those with questionable records would probably be called back.

Fifty *S*s selected at random from a group of 108 volunteers were advised about one week later that more testing with them would be necessary. From three to ten days thereafter, *S*s were seen individually and assigned alternately to a "stress" group or a "praise" group, each of which was given certain standardized antecedent information. Hence exposure to "stress" or "praise" following the establishment of an expectation of threat was the independent experimental variable.

For the "stress" group, *E* read a prepared statement indicating that an evaluation of *S*'s projective-test record had pointed to the presence of certain maladaptive features. The purpose of the testing about to take place, it was stated, was to provide further information about the accuracy of the diagnostic formulation.

In the case of the "praise" group, *E* read a prepared statement which stated that *S*'s projective-test record had been an outstandingly

[1]This paper is based in part on a dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, to the Graduate School of Syracuse University in August 1950.

[2]The present paper is one part of a more comprehensive experiment, reported elsewhere. Only a brief outline of procedures is reported here, since a fuller description is available in other sources [4, 5].

good one. These *S*s were told that we were interested in further testing because we wanted to find out how behavior on other tests correlated with good performance on the projective test.

After the situation had been structured in one of these two directions, *S*s were given the criterion water-jar test of problem-solving rigidity[3]. At the end of the experiment each *S* was asked to fill out several seven-point rating scales, based on attitudes toward the tests and test situation. Before leaving, each *S* was given an explanation of the nature of the experiment, and the random basis of his selection. All *S*s were advised that the projective test taken had not been used to evaluate either personality or adjustment.

Table 1
Comparison of Performance of "Stress" and "Praise" Groups

	Means				
	Stress	Praise	Diff.	t*	p
Mean no. of rigid solutions	5.12	3.16	1.96	3.063	.01
Mean total T/R	40.12″	33.60″	6.52″	1.575	.12
Mean T/R extinction problem	111.60″	75.20″	36.40″	2.379	.025

*For all comparisons, variance ratios were computed. In each instance approximately homogeneous variance between groups was demonstrated.

Results

The primary measure of problem-solving rigidity in the present study was failure to utilize a direct solution in the seven problems for which such a solution was available (six crucial and one extinction). Three secondary and somewhat overlapping measures of rigidity were also examined: (*a*) slower mean time of response (*b*) failure to solve the extinction problem and (*c*) slower time of response to the extinction problem [2]. Comparison of the performance of the two experimental groups is summarized in Table 1.

With respect to the primary measure of problem-solving rigidity (i.e., number of rigid solutions), Table 1 indicates that there were fewer such solutions in the "praise" group as compared to the "stress" group. This difference is significant at beyond the .01 confidence level.

Data are also presented in Table 1 for secondary rigidity indices. Here we observe that the "praise" group tended to have a more rapid over-all response time. The p value of .12 in this instance is not sufficiently large to preclude the operation of chance factors. The "praise" group did, however, respond significantly more rapidly to the extinction problem, and the difference between groups on this measure was reliable.

The final measure of problem-solving rigidity was nonsolution of the extinction problem. Eight *S*s in the "praise" group and twelve in the "stress" group failed to achieve a correct solution of the extinction problem in the 2½ minutes allotted. Chi-square analysis of this distribution demonstrated this difference to be nonsignificant, though it is in the expected direction.

The groups were also compared with respect to expressed attitudes toward the tests and test situations. On such comparisons the "praise" group expressed consistently more positive attitudes. Illustratively, in answer to the question "How much did you like doing these tests?", the difference between the groups was significant at the .001 level. Interestingly, when *S*s were asked to evaluate the diagnostic validity of the projective screening device used, the "praise" group responded more favorably than did the "stress" group, the differences being significant at the .001 level.

Discussion

The design of the present experiment was such as to induce a perception of stress in all *S*s, as they entered the criterion testing situation. This was achieved by administering a projective personality test and by advising *S*s that only those people with maladaptive personality features were to be called back for further testing. To the extent that *S*s perceived

[3]The specific series of test problems used is reproduced elsewhere [5]. Suffice it to point out here that the series consisted of 2 practice problems, 2 set problems, 4 crucial problems (soluble either by the roundabout set solution or an extremely direct solution), another set problem, an extinction problem (soluble only by an entirely new method), and finally two more crucial problems.

this structure as stressful, anxiety was induced. Thus in a limited sense the anxiety which *Ss* brought into the criterion testing situation may be regarded as an analogue of one type of anxiety which clients may experience as they are about to undertake a therapeutic relationship.

Reinforcement of the experimentally induced anxiety in the "stress" group was followed by highly rigid problem-solving behaviors. Significantly less rigid behaviors were noted in the "praise" group, presumably as a function of the anxiety-reducing effects of *E*'s praise and reassurance. That such praise did influence the perception of *Ss* in this group may be inferred from the significantly more positive attitude toward the tests and test situation which were expressed.

The implications of the present research for therapeutic practice are not direct, since the two experimental testing atmospheres may not be regarded as paradigms of actual therapeutic situations. The results of this study do seem to point to the feasibility of investigating problems of reduction of perceived stress under controlled laboratory conditions. Limited research in the area of experimental therapy to date [9, 12] has indicated the fruitfulness of this approach as an important medium for the scientific study of the process and effects of psychotherapy.[4]

Summary

A large group of *Ss* was given a projective test of personality, and told that their records would be evaluated by a board of clinicians. They were also informed that those having questionable records would be called back for further testing.

Fifty *Ss* from the larger group were later selected at random for additional testing, and assigned alternately to a "stress" and a "praise" group. In the "stress" group, *Ss* were told that their projective records contained certain questionable features, while in the "praise" group *Ss* were informed that their records had been outstandingly good. All *Ss* then took the criterion water-jar test of problem-solving rigidity, after which they filled out a series of attitude scales with respect to the tests and test situation.

On the primary index of problem-solving rigidity, significantly fewer rigid solutions were given in the "praise" group. Three secondary measures of rigidity were also studied. The "praise" group had a more rapid over-all time of response, fewer nonsolutions on an extinction problem, and a faster time of response on the extinction problem than did the "stress" group. The differences between groups were statistically significant only on the last of these three secondary measures.

The reduction of rigid behavior in the "praise" group was attributed to the anxiety-diminishing effects of the experimenter's reassurance. A crude analogy was made between the present study and certain aspects of the psychotherapeutic relationship. On the basis of the present findings, experimental therapy would appear to be a potentially fruitful area for future resaearch investigation.

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[4] A study by Morton Wiener now in progress at the University of Rochester is designed to examine the effects of several paradigm therapeutic situations on reduction of impairment of performance brought about by experimentally induced stress. One of the criterion performance measures being studied in this way is concept formation rigidity.

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Subjects' Evaluations of Annoying Situations after Being Described as Well Adjusted and Poorly Adjusted

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This report describes an experimental effort to induce some subjects to regard themselves favorably by advising that they were well adjusted. Other subjects were informed that they were poorly adjusted in order to make them view themselves unfavorably. No systematic attempt, other than by interviews, was made to ascertain if the subjects' conceptualizations of themselves were substantially changed. It was assumed that changes in the subjects' conceptualizations of themselves would be reflected in differences in their ratings of the disturbance values of a small sample of annoying social situations.

If these annoying social situations were evaluated significantly less disturbing by the subjects who were advised that they were well adjusted, then it would be concluded that these subjects' conceptualizations of themselves had been favorably altered. Favorable conceptualizations of themselves, it would appear, would lead subjects to view themselves as having ability in interpersonal relations [8, 9]. As a consequence of these feelings of ability, subjects probably would evaluate as much less disturbing many annoying social situations. How individuals arrive at positive conceptualizations of themselves leading to well-adjusted behavior is beyond the scope of this report [3].

If subjects, who had been advised that they were poorly adjusted, rated as more disturbing these annoying social situations, then it would be inferred that their conceptualizations of themselves had been changed as experimentally desired. These unfavorable conceptualizations of themselves should lead to feelings of powerlessness in human relations [8]. Annoying social situations should probably appear as more disturbing when subjects conceptualized themselves as deficient in power and ability.

Would subjects rate as more valid statements about themselves that they are well adjusted than other subjects would rate statements about themselves that they are poorly adjusted? If subjects do possess the need to enhance themselves [7], then they will be more likely to accept as valid the favorable descriptions of themselves by others. The unfavorable descriptions of themselves by others should be considered by the subjects as relatively more invalid. In order to enhance themselves, the subjects should show a tendency to cling to, as true, the positive characterizations of themselves by others [9]. On the other hand, negative characterizations of themselves by others should be more likely to be rejected by the subjects to protect themselves from unfavorable conceptualizations of themselves.

These testable hypotheses were formulated:

1. Subjects who are advised that they are well adjusted will evaluate annoying social situations as significantly less disturbing than prior to such advisement.

2. Subjects who are advised that they are poorly adjusted will evaluate annoying social situations as significantly more disturbing than prior to such advisement.

3. Subjects will evaluate as more valid descriptions of themselves as well adjusted, than other subjects will evaluate descriptions of themselves as poorly adjusted.

Subjects and Procedure

Twenty-eight students in an introductory clinical psychology class were administered the following rating blank, constructed by the experimenter and containing one-sentence descriptions of twenty-four annoying social

situations of the Rosenzweig P-F Study (5). Using a scale of one to five, the subjects evaluated each of the following twenty-four situations with regard to its degree of disturbance.

1. Your clothing has just been splashed by an automobile which drove through a mud puddle near the sidewalk.
2. The hostess is greatly upset over the fact that you have just broken her mother's favorite vase.
3. Your view of a motion picture is being obstructed by a large hat worn by a lady sitting in front of you.
4. You have just missed your train because your friend's car broke down while he was driving you to the station.
5. A woman is telling you that this is the third time that she has had to bring her new watch into the repair shop where you are employed.
6. You have selected four books at the library, but the clerk is now telling you that you are permitted only two at a time.
7. The waiter in the restaurant where you are eating has just accused you of being too fussy.
8. You were not able to go to a dance with your sweetheart and, now, one of your friends is telling you that she has asked him to take her.
9. You have just been told by the attendant in the pawnshop that you will have to wait until the afternoon when the manager comes before you can redeem your umbrella, even though it's raining now.
10. In the presence of another, you have just been called a liar by someone else who also insists that you know you are lying.
11. After having been awakened from sleep at 2 A.M. by the phone, you find that the party had the wrong number.
12. An acquaintance of yours has walked off with your hat by mistake, leaving his.
13. The person with whom you arranged an appointment the day before tells you, upon arrival, that he can't see you.
14. You and a friend have been waiting on a windy street for another person who should have been there ten minutes ago and is still not in sight.
15. Although you played very skillfully, you have just lost a game of cards because of a stupid mistake of your partner.
16. You have just had an automobile accident and the other party involved has told you that it is your fault since you had no right to try and pass him.
17. While you are searching for the keys to the car, your wife is reprimanding you for having lost them at such an inopportune time.
18. You have just been told that the last of the items which you desired has been sold.
19. You have just been forced off the road by a motorcycle policeman who is asking you where you were going when you drove past a schoolhouse at 60 miles an hour.
20. You are sitting in a room with a friend while another friend is having a party next door to which you were not invited.
21. Someone has just told you that the person you were making slanderous remarks about has had an accident and has been taken to the hospital.
22. You have just fallen down in the presence of two men and one of them asks you if you are hurt.
23. Your wife and you are being detained from beginning a trip by an aunt who has just called and asked if you won't wait for her to come and give you both her blessings—again.
24. A torn newspaper has just been returned to you by a neighbor who explains that his baby tore it.

A disturbance-rating score was obtained for each subject. A high score indicated that these social situations were regarded as greatly disturbing while a low score signified that these situations were viewed as slightly disturbing. This disturbance-rating blank was taken by the subjects five weeks previous to their exposure to the experimental conditions. The group Rorschach test and the group Thematic Apperception Test were administered at the same time.

After these tests were taken, half of the subjects, fourteen in number, were given the following descriptions, in identical words, stating that they were well adjusted:

An analysis of your Rorschach and other test data reveals that you are a well-adjusted individual who has succeeded in getting rid of unnecessary and harmful feelings of inadequacy. You have arrived at a stage where you recognize realistically your capacities and know your worth in comparison with others. You appear to have established a stable and satisfying philosophy of life which you use as a frame of reference in attacking your daily problems.

You appear to have succeeded in controlling your emotionality so that it works for your benefit. When you are frustrated, you have been fairly consistently able to substitute almost as acceptable goals and responses for those that could not be immediately satisfied.

Your relationships with others are satisfying without your becoming overly emotionally involved. You appear to be objective and rational in most of your dealings with others. You do not appear to be apprehensive about the future. You are a normally gregarious person who enjoys being with others.

You have succeeded in working out a satisfactory sexual adjustment, and have no abnormal fears

or anxieties about this area. You have good contact with reality and are able to plan and initiate action that is constructive. You have little trouble with regard to concentration upon tasks.

In summary, you are a well-adjusted, well-rounded, outgoing personality. You have developed pleasing and adaptive reactions to disturbing circumstances. It is to your credit that you have overcome many unnecessary feelings of inadequacy and inferiority.

The other fourteen subjects were advised that they were poorly adjusted, each one given the following identically worded description:

An analysis of your Rorschach and other test data indicates that you are an anxious person who is considerably concerned over your felt inadequacies. You have the feeling that you are inferior to others in intellectual capacities. When you compare yourself to others in this respect, you find yourself lacking to a considerable extent.

You have a tendency to find emotional relationships with other persons quite disconcerting. Instead of remaining objective and rational you are prone to become emotionally involved in your contacts with others. Often, you avoid others because of some inexplicable dislike, on your part. You sometimes manifest almost chronic apprehension with respect to the future which you feel may bring disastrous consequences. You are apt to become unreasonably distressed over failures instead of taking them in your stride. You have a distinct need to have other people like and admire you but you often feel that an insufficient amount of attention is given you. Your sexual adjustment is a definite problem which appears difficult to resolve. Although you may appear self-controlled outside, you tend to be insecure and emotional inside. Much of the time you have serious doubts as to whether you have made the right decision or have done the right things. Some of your wishes are a bit unrealistic. You are prone to do a great deal of daydreaming which is rarely put into concrete achievement. You are afraid to volunteer for many activities because you fear failure and ridicule, although, of course, you rationalize these fears. At times, you find it most difficult to concentrate upon the tasks at hand. You appear to be hypersensitive to many minor distractions.

In summary, yours is a personality that manifests considerable insecurity, a rather marked degree of anxiety, a fantasy life that is not too close to reality, much vacillation and doubt over your conduct of affairs, with many deep-seated feelings of inadequacy and inferiority.

The Rorschach and TAT were not used for these descriptions. In order to avoid the arousal of suspicion, the experimenter distributed these descriptions so that each subject who was tendered a well-adjusted description was seated adjacent to a subject who had been given a poorly adjusted description. This was the only consideration in dividing the subjects into the two groups. Since the seating of the class had not been based upon any plan, it was believed that the two groups were randomly divided and were not significantly different in any relevant trait. A more appropriate division of the subjects would have been achieved by setting up two groups equated on the basis of their scores on this rating blank.

These descriptions (well adjusted and poorly adjusted) were preceded by an explanation that projective techniques, especially those given on a group basis, required further proof of their validity. Accordingly, the subjects were requested to rate, on a scale of one to five, how well the descriptions of themselves coincided with their own conceptualizations of themselves. Finally, immediately after reading and rating the descriptions, the subjects filled out the aforementioned rating blank again. A control group of twenty-eight subjects, from another introductory clinical psychology class, was administered the rating blank on two separate occasions, five weeks apart, without the intervening experimental conditions.

Observations of the experimental subjects revealed many of them were profoundly moved by these descriptions of themselves. There were many instances of great concern with these descriptions, such as downcast faces, banging of pencils on seats, etc. Others were very pleased, displaying beaming expressions. Interviews with the subjects, after they were assured that these descriptions were spurious, corroborated these observations and indicated that these descriptions had been seriously considered. Incidents reported later by the subjects included forgetting books, forgetting where they had parked their cars, etc.

Results

The subjects who were advised that they were well adjusted (hereafter called the "well-adjusted" group) had a mean pre-experimental disturbance-rating blank score of 60.14, standard deviation 12.03 and a mean postexperimental disturbance-rating score of 54.42, standard deviation 12.30 (Table 1). The subjects who were advised that they were poorly ad-

Table 1
Disturbance-Rating Blank Scores of the "Well-Adjusted," "Poorly Adjusted," Control, and Effective-Study Groups

Group		Range	Mean	SD	Correlation Coefficient	*t*
"Well Adjusted"	Pre-Experimental	39 to 83	60.14	12.03	.87	3.01*
	Postexperimental	36 to 78	54.43	12.30		
"Poorly Adjusted"	Pre-Experimental	39 to 75	55.57	10.83	.69	.42
	Postexperimental	42 to 75	56.50	10.93		
Control	1st Administration	31 to 71	55.43	8.96	.82	.79
	2nd Administration	30 to 78	54.46	10.25		
Effective Study	1st Administration	48 to 90	66.21	12.20	.83	1.40
	2nd Administration	35 to 95	64.31	12.41		

*Significant at the 1 per cent level.

justed (hereafter called the "poorly adjusted" group) had a pre-experimental mean disturbance-rating score of 55.57, standard deviation 10.83, while their postexperimental mean disturbance-rating score was 56.50, with a standard deviation of 10.13. While the pre-experimental mean of the "well-adjusted" group was higher than that for the "poorly adjusted" group, the test for the significance of the difference between the means was negative, a *t* value of 1.01 being computed. The control group had a mean disturbance-rating score of 55.43, standard deviation 8.96 for the first administration, and a mean score of 54.20, standard deviation 10.25 for the second administration. In connection with another investigation, the disturbance-rating blank was filled out by students in the class for teaching effective study habits. Most of the students enrolled in this effective-study class had been seen by the counseling center for assistance with their school problems. Their initial mean disturbance-rating score on this blank was 66.21, standard deviation 12.20, while their mean score on the second administration, about four weeks later, was 64.31, standard deviation 12.41.

The coefficients of correlation for the disturbance-rating scores of the "well-adjusted," "poorly adjusted," control, and effective-study groups are also shown in Table 1. For the "well-adjusted" group, the difference in mean pre- and postexperimental scores was significant at the 1 per cent level, a *t* value of 3.01 being obtained (Table 1). There was no significant difference between the mean pre- and postexperimental scores of the "poorly adjusted" group. For the control and effective study groups, the differences between the means of their respective two administrations were not significant.

It might have been argued that since the "well-adjusted" group started with a higher (though insignificant) mean disturbance-rating score than the "poorly adjusted" group, it could have been anticipated that their mean score on the second administration should fall to the level of the "poorly adjusted" group regardless of any intervening experimental condition. This reasoning was apparently controverted by the mean scores of the effective-study group. Even though the initial mean disturbance-rating score was significantly higher than those of both experimental groups, the second mean disturbance score of the effective-study group did not fall significantly.

Finally, the "well-adjusted" group had assigned a mean validity rating of 4.14, standard deviation of .83, for their descriptions, while the "poorly adjusted" group had a mean validity rating of 3.29, standard deviation 1.17. There was a significant difference between these means at the 5 per cent level, a *t* value of 2.18 being computed.

Discussion

The subjects who were advised that they were well adjusted did evaluate annoying social situations as less disturbing than prior to such advisement. Annoying social situations became significantly less disturbing probably because the subjects had conceptualized them-

selves in conformity with another's positive evaluation of themselves. Evidence from the interviews supported the subjects' favorable conceptualizations of themselves as having ability in social situations. It may be concluded that subjects, when described as well adjusted by others, will conceptualize themselves favorably, which conceptualizations probably include feelings of power in human relations and lead to significantly less felt disturbances in the usual annoying social situations. One likely consequence of such less felt disturbance is that more aspects of these situations may become available to awareness so that behavior may be based upon fuller recognition of the elements of situations, possibly leading to better adjustive reactions [2, 4, 6].

From this conclusion, two questions follow. Initially, what importance may be ascribed to this significantly less disturbing evaluation of situations? And what is the nature of the process that eventuates in the subjects' favorable conceptualizations of themselves? No answers to these questions can be obtained from the data of this investigation. Further research is essential.

The subjects who were advised that they were poorly adjusted did not change significantly in their evaluation of annoying social situations. There may be many explanations but two possibilities, only slightly different, will be described. These subjects may have conceptualized themselves unfavorably but did not permit these unfavorable conceptualizations to affect their evaluations of annoying social situations. Such unfavorable conceptualizations of themselves may have been isolated so that these conceptualizations had little bearing upon the evaluations of annoying social situations. The second possibility is that these subjects did not conceptualize themselves unfavorably because they had either rejected or distorted such descriptions. Since there was no change in their conceptualizations of themselves, the subjects did not revise their evaluations of annoying social situations.

The high validity ratings attributed by the subjects to these spurious descriptions cast serious doubt upon the technique of self-validation as a useful method of validating projective techniques [1]. These validity ratings may be excessively high because the subjects turned them in to the experimenter (also the class instructor). It must be recalled that the experimenter did tell the subjects that group projective techniques required further validating research. It does appear that descriptions of individuals can be phrased so vaguely and inclusively that almost everybody can see himself more or less accurately portrayed thereby.

The fact that subjects assigned significantly higher validity ratings to their well-adjusted descriptions than did those subjects who were described as poorly adjusted, confirmed the hypothesis that favorable descriptions would be more acceptable and would be found more accurate than unfavorable ones. The need of subjects to enhance themselves resulted in their giving greater credence to more or less idealized but spurious descriptions of themselves. This tendency, in and of itself, is of great value for individuals' development if these positive descriptions are incorporated, even in part, into their conceptualizations of themselves and eventually cause more adjustive behavior.

Summary

Fourteen subjects were given identically worded statements that they were well adjusted. Another fourteen subjects were advised, in identical words, that they were poorly adjusted. Immediately following these descriptions, the two groups filled out a rating blank describing twenty-four annoying social situations. Scores on this administration of the blank were compared with scores on the same rating blank completed five weeks prior to the experiment. There was a significant lowering of the postexperimental scores of the group given the well-adjusted descriptions. There were no significant differences between the scores on the two administrations of this rating blank for the group given the poorly adjusted description, for the control, and for the effective study groups.

The interpretation was offered that the subjects who were described as well adjusted conceptualized themselves favorably as having ability in human relations, and thus found annoying situations significantly less disturbing. Finally, significantly higher validity ratings were assigned to well-adjusted than to

poorly adjusted descriptons. It appeared that the need for subjects to enhance themselves resulted in their giving greater credence to more or less idealized descriptions of themselves.

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A Method for Assessing Self and Not-Self Attitudes during the Therapeutic Series [1]

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In 1943 Raimy advanced one of the pioneer statements [6] of the self-concept theory of personality organization and developed and demonstrated a methodology for studying a client's self-references during psychotherapy [7]. This, the PNAv Method, consisted essentially of tabulating the number of positive, negative, ambivalent, and ambiguous self-references made by the patient during the therapeutic interview. When successful and unsuccessful cases were compared, it was found that the former showed an increase in positive and a decrease in negative self-references, while the latter did not.

The present report describes an extension of Raimy's PNAv method to take account of references not only to the self but also to the not-self and to relations between the two. This extended analysis has been termed the "Conceptual Matrix" method to identify it with the matrix of relations which it seeks to explore. This matrix is outlined below:

The *self polar* category: self-references of the "I am. . ." variety, *e.g.*, "I am happy today."

The *self-on-self* category: statements about the manner in which one aspect of the self is seen to affect another, "My headache keeps me from doing things."

The *not-self-on-self* category: descriptions of the manner in which that which is not a part of the Self is seen to affect the Self, "Mary is very good to me."

The *self-on-not-self* category: references to the manner in which the Self is seen to affect that which is Not-Self, "I stopped him from going just in time."

The *not-self-on-not-self* category: reported perceptions of the manner in which one referent which is not a part of the Self is seen to affect another such referent, "The movies are ruining American artistic tastes."

The *not-self polar* category: single not-self referents not seen in relation to any other referents, "John is quite ill."

Procedure

The method is used to study verbatim, subject-produced materials, either interview typescripts or personal documents. Three steps are involved: Analysis of the material into its component thought units, *categorizing* each thought unit in terms of the matrix described above, and *evaluating* the feeling tone of the units.

The unit chosen for the method is the thought unit, which is roughly patterned on the independent clause of the grammarian. This unit seems most appropriate in a methodology designed to get at explicit content and to avoid the use of interpretation. The average fifty-minute therapy interview yields in excess of 350 such units of patient speech.

The evaluation of feeling tone employs a minor adaptation of Raimy's PNAv procedure. Four values are recognized, as follows:

Positive or approving: e.g., "I feel well today."
Negative or disapproving: "She irritates me constantly."
Ambivalent: "I can't make up my mind whether I like studying well enough to go on or not."
Descriptive: "That was the third time we had met."

Reliability

Four raters were given approximately ten hours training in the use of the method. Each was provided with a copy of a twenty-seven page rating manual. Their ratings of five pro-

[1]This is a condensation of a portion of a dissertation completed in 1948 at the Ohio State University. Appreciation is expressed to members of the writer's committee who contributed so much to him and to the research: Drs. Victor C. Raimy, George A. Kelly, Francis P. Robinson, Harold A. Edgerton, and Delos D. Wickens.

tocols were compared with those of the investigator. The results indicate adequate interrater reliability. For unit-by-unit comparisons, the following percentages of agreement were found: unit determination 87.4 per cent, categorization in terms of the matrix 59.1 per cent, and evaluation of feeling tone 75.0 per cent. Reliability coefficients may also be given using the method of common elements [5]: Unit determination = +.937, categorization = +.798, and evaluation = +.869.

Consistency

The reliability data just presented have to do with the agreement among raters in the use of the method. There is a further reliability question in relation to the Conceptual Matrix itself. Since the method concerns itself only with that which is explicit, the question may legitimately be raised as to whether day-to-day fluctuations in the subject's mood or experience might not so affect what he expresses as to make it of little significance in understanding him. In other words, how consistent is the Conceptual Matrix itself?

Some evidence may be produced in answer to this question. In *Counseling and Psychotherapy* [8], Rogers provides the verbatim protocols of eight therapeutic interviews with a patient to whom he gives the name, "Herbert Bryan." Each of these contacts was analyzed by the Conceptual Matrix method and a profile of twenty-four points (all possible category and value combinations) was constructed for each session. Rank-differences correlation coefficients were then computed between each pair of interviews. The 28 coefficients which result have a median value of +.815, which is, of course, significant well above the 1 per cent level [3]. It would thus appear that there is a pronounced degree of consistency in the Conceptual Matrix itself. This becomes even more evident when it is recognized that these interviews represent a therapeutic series judged to eventuate in success and thus one in which changes in the client's expressed attitudes (references to his self and not-self experiences) are to be expected.

Findings

Further reports based on the ratings of the Bryan case may now be made. This series of contacts makes possible demonstration of the type of intra-individual descriptions which the method yields. The case is described by Rogers as "a young man in his late twenties, who came to a psychological counselor for assistance . . . highly intelligent, definitely neurotic, verbalistic and intellectual in his interests" [8, p. 264].

No attempt will be made here to report exhaustively upon the ratings in each matrix category and feeling-tone "value." In general, it seems to be possible to make meaningful and quantitative descriptions of either the content or the mood of each of the contacts in the series [1]. Of somewhat more interest, however, is the study of the combined influences of the categories (matrix content) and values (attitudes). Accordingly, a statistical test was made to investigate the interrelation of these two variables and a third, the sequential

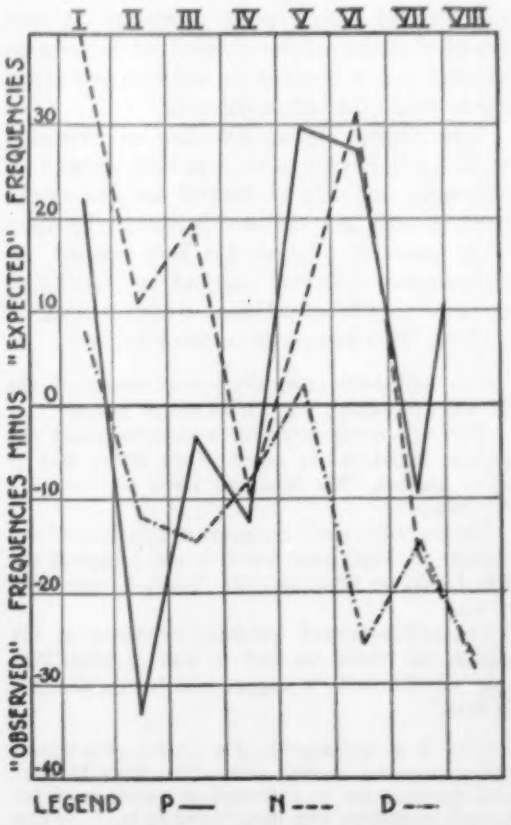

Fig. 1. Deviations from expected frequencies of values in the combined Self Polar and Self-on-Self categories (i.e., in the Self area).

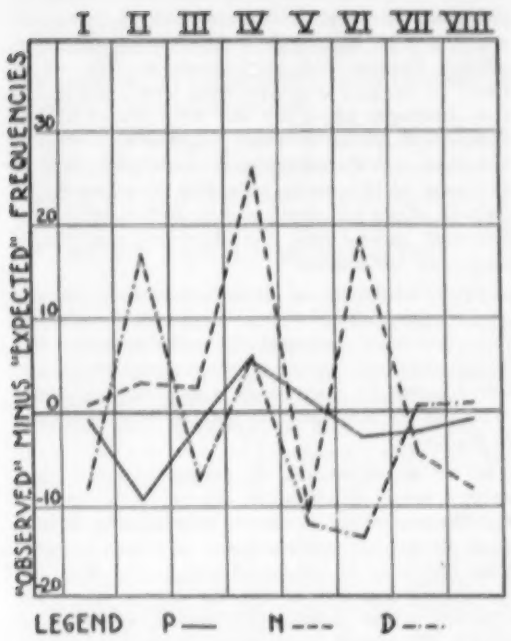

Fig. 2. Deviations from expected frequencies of values in the Not-Self-on-Self category.

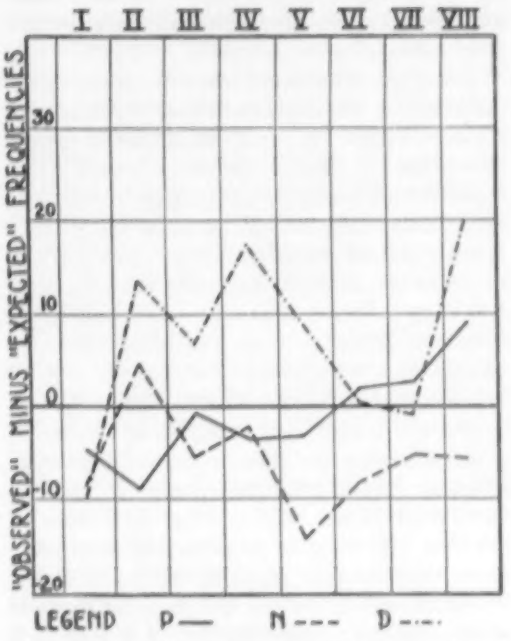

Fig. 3. Deviations from expected frequencies of values in the Self-on-Not-Self category.

position in the interview series. For this purpose, a three-dimensional chi-square test[2] was employed of the null hypothesis that category, value, and interview position are really independent of each other. The product of these computations was found to be $\chi^2 = 631.9112$ ($df = 42$). Since the usual table of chi square does not extend to this number of degrees of freedom, it was necessary to compute z through the formula provided by Edwards [4, p. 113]. The value of z was found to be 26.5249, which is highly significant, of course. On this basis, it was found possible to reject the hypothesis that serial position, category, and value were functioning independently of each other. In other words, it seems likely that what the subject says about himself or that which is not himself and the feeling tone

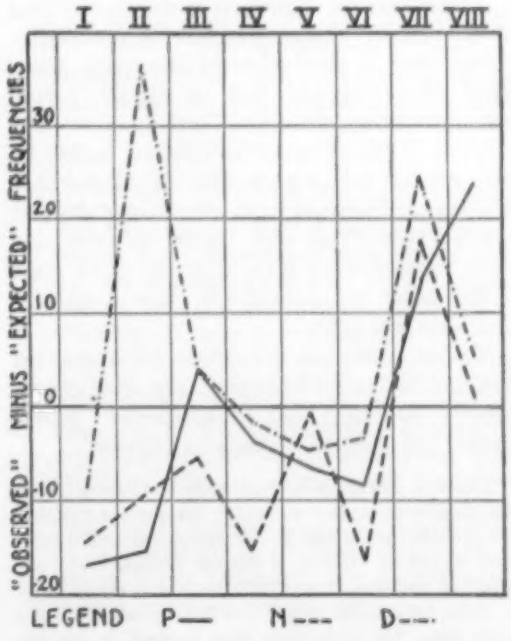

Fig. 4. Deviations from expected frequencies of values in the combined Not-Self Polar and Not-Self-On-Not-Self categories (i.e., in the Not-Self area).

[2]The aid of Drs. H. A. Edgerton and G. A. Kelly in working out this test is gratefully acknowledged. The formula used is that usual for chi square with an extension to three dimensions accomplished by the redefinition of the "expected" frequency for any cell as: $e = \frac{I \cdot C \cdot V}{N^2}$, where I is the interview-row total, C is the category-column total, and V is the value-aisle total.

which he expresses are related to each other and both are related to when in the interview series the statement is made.

Using the difference-from-expectancy values provided by the computation of chi square, it becomes possible to study the protocols against a base line provided by the client himself. This is illustrated in Figures 1 through 4. One may read these curves in this way: a point above the horizontal straight line at the center of the ordinate indicates a greater than expected frequency of units relating to that area of the Conceptual Matrix and expressing that attitudinal tone indicated in the legend; a point below this horizontal indicates less than expected frequency. For example, in Figure 1, which describes the client's discussion of himself and his internal experience, it will be noted that Bryan talks a great deal more in the first interview in negative self-descriptive terms than he does again in the entire series. In the second interview, this negative element is less relative to the first, but it is still well above its (over-all) expected share.

Discussion

In viewing the figures, it is worth recalling that adequate experimentation in personality theory and in psychotherapy has many times been blocked by the lack of suitable means for describing the individual subject and changes in his adjustment. While it would be presumptuous to suggest that the Conceptual Matrix method as it is here demonstrated satisfied this need adequately, it does not seem unrealistic to hope that the more basic methodology represented [2] may eventually approach this goal.

To see how such objective and quantified descriptions might describe the therapeutic process, one may take a measure of "poetic license" to read the figures as follows:

The first interview is frequently considered to be the complaint contact in which the subject presents his problem as he sees it. Accepting this interpretation, Bryan is offering a highly emotionalized account of the conflict within himself but taking care to insist upon some of his own good qualities at the same time. He finds little that is good in his environment, although he does not engage in any appreciable amount of discussion of it. In general and except when discussing himself, he attempts to demonstrate his objectivity and detachment.

Apparently one of the more important contacts of the series, the second interview yielded the greatest number of ratings. It is the scene of many significant changes and extreme scores. The "good front" of the first interview falls away, and defensive statements about the self drop markedly. Relations with the environment begin to receive more attention, and the subject says the most he will at any time in the series regarding how poorly he feels he affects his world and its failure to provide him with satisfactions. Defensive measures consist largely of verboseness.

The third interview seems to portray a reaction to the experience of the previous contact with its rather extreme portrayal of maladjustment. Although the proportion of negative expressions in the self area climbs, the upward swing of positive attitudes in all areas seem to indicate a readjustment is beginning.

In the fourth session, the subject begins to open up new areas. Significantly, the value balances do not change, and he appears to be protecting himself or no longer to require extreme emotional releases. This interview is concerned extensively with environmental interactions with the subject, who gives relatively minor attention to himself or to the world insofar as either is not related to the other. There is a suggestion that the client is trying to keep his problem external and to attribute some of the blame for it to others.

The fifth interview sees a rise in favorable statements toward the self which might be a tentative or "trying-out" gesture. It is coupled with a lessening of pessimistic views about relations with the environment. This seems to be a transitional phase.

The sixth interview shows a strong gain in emotional tone, particularly in relation to the self. Self-disapproval is as open now as it will be. This appears to be balanced by a renewed review of the unfavorable manner in which the environment affects the patient.

The attention to interaction with the environment which was marked in the preceding three contacts is replaced in the seventh with direct discussion of environmental interaction in which negative feelings are marked but do not overbalance positive and descriptive statements. Even the otherwise consistently greater concern with the self receives secondary attention.

The final interview appears to be highly euphoric with positive expressions frequent and negative infrequent in almost all areas. The pattern shows such a radical change from that of any preceding interview that one could wish that the series had been extended for one or two additional contacts in order to permit a determination as to whether a new and lasting profile had truly been established.

Thus it is possible to report on the participation of the patient in rather rich terms

which are in turn based upon careful objective ratings. Further, the report is available in quantitative form to make possible more precise testing of hypotheses or comparisons between contacts or patients.

Such a use of the data in testing hypotheses may be illustrated in another way. If operational goals of therapy are erected in terms of the method, it is possible to test whether they are attained. This is illustrated below:

If the goal of therapy is *an increase in positive attitudes*: then success occurs in the *not-self area and the self-on-not-self category.*

If the goal of therapy is *a decrease in negative attitudes*: then success occurs in the *self area.*

If the goal of therapy is *both an increase in positive and a decrease in negative attitudes*: then success occurs in *no area or category.*

The present study cannot, of course, attempt to provide a statement of the goals of therapy, but it should be evident that such a method as is here described makes possible description of present status, delineation of goals, and verification of their attainment.

Summary

The Conceptual Matrix method is described as growing out of Raimy's development of the PNAv Method for studying self-references in therapeutic protocols. The Conceptual Matrix is composed of references to the self, the not-self and the interrelations within and between these two poles.

The method calls for the study of the thought units expressed by a patient and their rating into the categories of the matrix and the values representing feeling tone. This rating process is found to be reasonably reliable when several different persons rate the same protocols.

The Conceptual Matrix itself appears to be reasonably consistent from one interview to another when the total profiles of category-value combinations are compared between contacts. In other words, that which is assessed by the method is not so superficial or fluctuating as to have little meaning.

There is, furthermore, a relationship among the three major variables involved in the study of a therapeutic series through the use of the method, i.e., among the frequency of use of the several categories, values, and the position in the interview series.

The ratings provided by the method make possible objective, quantitative description of the therapeutic process. This, in turn, may be converted into meaningful verbal descriptions which may help understanding of what is occurring.

Likewise, the ratings lend themselves to the erection of experimental hypotheses about therapy which can be subjected to statistical test. This is illustrated in relation to therapeutic goals.

At the stage of development here reported the method is still crude and cumbersome. However, there is the suggestion that with refinements and much development a more facile instrument may emerge that will provide at least one line along which diagnosis, treatment, progress checks, and evaluation of outcome may be made truly coordinate.

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Perceptual Size Constancy of Known Clinical Groups[1,2]

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Perceptual constancy, long considered in the domain of experimental psychology, is now coming of importance in clinical-social psychological research. Many attempts have been made to find theoretical bases for the constancy phenomenon, but only recently have personality factors begun to take prominence in this theorizing. In 1938, Sheehan, quoting Izzet's findings that a lower constancy is more characteristic of schizothymes, stated, "While no great weight can be attached to the theory that personality may be one of the factors determining constancy, it is perhaps worth noting that Thouless has also reported (unreliably) lower ratios for a group of schizothymes" [7, p. 20]. More recently, in a study involving judgments of sizes by people who were evaluated as to personality characteristics, Holzman and Klein concluded, "Patterns of psychophysical response express stable perceptual attitudes and are predictive of personality tendencies" [4, p. 312]. Singer [8] found different size-constancy ratios for "thinking introverts and extroverts" under conditions of experimental frustration. Bruner suggests that there is a definite relationship between personality dynamics and perceptual mechanisms. With reference to the schizophrenic as viewed from psychoanalytic theory he asks, "Might not we predict for example that a withdrawal from object relations and an increasing concern for the self would lead to a breakdown in such phenomena as size and shape constancy? Might not apparent size and shape conform more toward retinal proportions than toward 'real object' proportions particularly so if the stimulus objects used were other people?" [1, p. 142].

Rorschach workers have long considered color responses to be intimately associated with the subject's affective status. In addition, Rorschach felt that certain subjects (particularly neurotics) experience an unmistakable "color shock" when the achromatic blots are followed by the chromatic blots. These phenomena, encountered frequently in connection with color, evince, according to Rorschach, "the internal relationship which must exist between color perception and the dynamics of affectivity" [5, p. 35].

The present study is a preliminary attempt to investigate the size-constancy phenomenon in known clinical groups. The major variable studied was normality, i.e., gross personality differences as manifested by groups of unclassified neurotic and ambulatory psychotic patients. In addition, the effects of color, size, and sequence of presentation on size constancy were investigated.

The questions asked were:

1. Do patients diagnosed as psychotic or neurotic produce size-constancy ratios which differ from those obtained from presumably normal controls?

2. As might be inferred from some of the Rorschach hypotheses, do color and/or order of presentation have significant effects on the size-constancy ratio of these known clinical groups?

[1]From the Veterans Administration Regional Office, Milwaukee, Wisconsin.

[2]The authors are indebted to George Calden who, together with Richard Sanders, conceived the initial idea and who collaborated on some exploratory work at the University of Michigan in 1948.

3. Are the interactions of the above variables significant?

Procedure and Design of Experiment

Three groups of ten male subjects each were used in the present study. Two of the groups, the neurotic and the psychotic, consisted of randomly selected patients from the patient population of the Madison Veterans Administration Mental Hygiene Clinic. The selection criteria for these two groups were: (*a*) psychiatric diagnosis, (*b*) psychological test confirmation of this diagnosis (in most cases) and (*c*) a VA disability rating of 30 per cent or more for the neurotics and 50 per cent or more for the psychotics. The control group consisted of volunteer University of Wisconsin undergraduates who had never had any psychiatric contacts. All of the thirty subjects had normal acuity and color vision. The age of the subjects ranged from 19 to 41 with a median age of 27.

All subjects were given individual appointments and were tested in the same room under similar conditions. Each subject was seated on an adjustable chair at the foot of a five-meter-long table covered with white sheeting. Both eye level and room illumination were kept constant. At the far end of the table (five meters from the eyepiece[3]), a series of 13 black squares ranging in size from 35 to 90 mm. in 5-mm. step intervals was randomly arranged under a consecutive series of numbers so that each square could be readily designated by number. Subjects were instructed that squares would be presented to them for comparison with the fixed standard series. They were to select the one standard-series square which was equal in size to the stimulus square. Five each of black, blue, green, yellow, and red stimulus squares ranging in size from 50 to 70 mm. in 5-mm. step intervals were utilized.

The 25 stimulus squares were presented individually, first at a distance of four meters from the subject and then at two meters from the subject. Two presentation orders were used at each distance. The first order (regular order) consisted of all similarly colored squares, irrespective of size, being presented consecutively. As a result all judgments of black squares were completed before green squares were presented, etc. The second order (irregular order) consisted of the stimulus squares presented in random fashion in regard to both size and color. In order to confound sequential effects of color and size, half-plaid latin squares were used to determine the regular order, greco-latin squares for the irregular order. The same regular and irregular presentation orders, for a particular subject, were used at both distances. All in all, five sizes of squares (50, 55, 60, 65, 70 mm. square) in five colors (black, blue, green, yellow, red) were presented in two sequences (regular, irregular) at two distances (two meters, four

[3]The eyepiece consisted of a stereoscope hood from which the lenses were removed. This, together with a chin rest, served to hold the head in a fixed position.

Table 1

Analysis of Variance of Size Constancy Indices

Source	Sum of Squares	*df*	Variance Estimate	*F*
Color	1530.17	4	382.54	6.22***
Size	3078.32	4	769.58	12.51***
Sequence	1708.70	1	1708.70	27.78***
Normality	75798.10	2	37899.05	616.24***
				*3.50**
Ss within	292009.73	27	10815.18	175.86***
C x Si	2238.19	16	139.89	2.27**
C x Seq	799.72	4	199.93	3.25*
C x Norm	837.77	8	104.72	1.70
Si x Seq	447.29	4	111.82	1.82
Si x Norm	756.92	8	94.62	1.54
Seq x Norm	281.21	2	140.60	2.29
Ss x C	16165.03	108	149.68	2.43***
Ss x Si	13525.48	108	125.24	2.04***
Ss x Seq	11656.04	27	431.70	7.02***
C x Si x Seq	1491.66	16	93.23	1.51
C x Si x Norm	2384.51	32	74.52	1.21*
C x Seq x Norm	1736.05	8	217.01	3.53***
Si x Seq x Norm	710.14	8	88.77	1.44
Ss x C x Si	39597.41	432	91.66	1.49***
Ss x C x Seq	14038.53	108	129.99	2.11***
Ss x Si x Seq	8748.76	108	81.00	1.32***
C x Si x Seq x Norm	3221.26	32	100.66	1.64**
Ss x Si x Seq x C	26567.01	432	61.50	
Total	519328.00	1499		

***Significant at or beyond the .001 level of confidence.
**Significant at or beyond the .01 level of confidence.
*Significant at or beyond the .05 level of confidence.

meters) to each of three types of subjects (neurotics, psychotics, normals).

The judgments of the subjects were translated into size dimensions and entered into the following constancy-index equation:

$$\text{Size-Constancy Index} = \frac{\text{Size}_{near} - \text{Size}_{far}}{\text{Size}_{near}}.$$

A constant of one was added to the ratio obtained from the above equation to eliminate negative scores and the index was multiplied by 100 to eliminate decimals. Thus, for example, an index of 100 would represent perfect constancy; 110 would indicate that the distant stimulus was judged smaller in size than the near stimulus; 90 would mean that the far stimulus was judged greater than the near. The variance in the obtained constancy scores was analyzed in accordance with the design shown in Table 1.[4]

Results

The results of the over-all analysis of variance are shown in Table 1. The error term was the variance estimate of the *Ss*×*Si*×*Seq*×*C* interaction. An additional *F* test for *Normality* was made in which the error term was the *Ss within* variance estimate. The latter is printed in italics in Table 1. With the exception of this additional test, only those *F* tests which are at or beyond the .001 level were accepted as significant by the authors.[5]

With respect to the main variable of *Normality*, it will be noted not only that this variable is significant at the .001 level when the basic error term is used, but also that it is significant at the .05 level even after the large *Ss within* variance has been taken into consideration. The mean constancy indices are 105 for the controls, 99 for the neurotics, and 88 for the psychotics, strongly suggesting that different perceptual factors are operating in each group.

Of specific pertinence to the questions asked in this study is the finding that the interaction of *C*×*Seq*×*Norm* is significant at or beyond the .001 level. It is noteworthy that this is the only interaction (with the exception of those involving *Ss within*) that reaches this level of significance. The six curves representing this interaction are shown in Figure 1. Although the total effect of color is significant at the .001 level, a further analysis (using the significant interactions as error terms) suggests that the effect of color per se is not significant above and beyond the interaction effects. This is not true in the case of the main variables of sequence and size which appear to be significant above and beyond their interaction effects.

As would be expected in any study involving abnormal subjects, particularly psychotics, the *Ss within* variance is markedly large and, as a result, all of the *Ss within* interactions are significant at the .001 level.

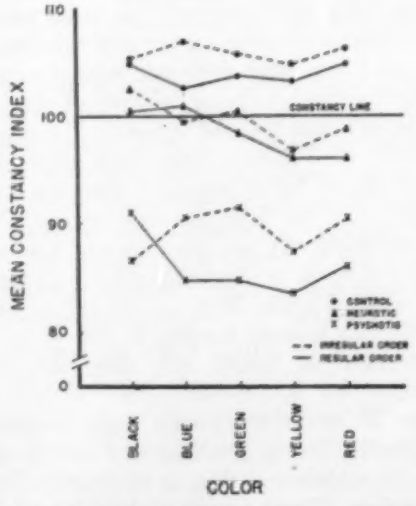

Fig. 1. The effect of color sequence on the size-constancy indices of normals, neurotics, and psychotics.

Discussion

The exploratory nature of the design, the

[4]The authors wish to thank Dr. David A. Grant, University of Wisconsin, for his generous assistance with this design. The authors, however, assume sole responsibility for the interpretation of the material presented.

[5]Bartlett's chi-square test of homogeneity produces a chi square significant at the .01 level of confidence. Since the means and variance of the three groups were uncorrelated, it was not deemed advisable to transform the raw data. In view of this, it was felt necessary to demand a high level of confidence and the authors, on an a priori basis, established the .001 level as necessary for acceptance. Lack of homogeneity was not considered to be such a pertinent factor where a lower-order variance estimate was used as the error term and in such cases the .05 level of significance was deemed acceptable.

small N, the gross groupings of subjects with respect to personality classification, etc., make definitive analysis and interpretation impractical. Nevertheless, the above results strongly suggest that known clinical groups of subjects show differences in the perceptual mechanism of size constancy. There seems to be a positive relationship between increasing personality disturbance and overestimation of the distal stimuli. One might think of Thouless' description of the constancy process, "phenomenal regression to the real object," [9, p. 344], as a defense on the individual's part against the ever-changing perceptual field. Constancy occurs, as Brunswick [2] has suggested, in the interest of stabilizing the perceptual world.

In the present study the normals showed some inconstancy; their size judgments of the distal were smaller than those of the proximal stimuli. The neurotics showed almost perfect constancy. They compensate for the decrease in visual angle and tend in some cases to overcompensate so that the distal stimulus is judged larger than the proximal. This trend toward overcompensation is most apparent in the psychotics, who overestimate the distal stimulus. This overcompensation may well be related to increasing personality disturbance and possibly increasing perceptual defensiveness. Considered in this light we might characterize the normals as flexible and showing little need to defend, the neurotics as rigid and showing strong defensive needs, and the psychotics as overreacting in their attempts to defend and going beyond reality limits.

The present results suggest findings which are similar to those of Thouless [10], namely that psychotics show less size constancy than normals. Although Bruner [1] predicts a breakdown in size constancy for schizophrenics, the direction of this breakdown is not corroborated by the present data. Rather than their size judgments conforming more toward retinal proportions than real object proportions, these data suggest that the psychotic overcompensate and go beyond the real object size.

The study was also designed to explore some of Rorschach's hypotheses regarding the influence of color on perception. This was done by experimentally varying the impact of color in the present controlled perceptual situation. In order to think of the present situation as analogous to the Rorschach, the following assumptions must be made:

1. The colors in the present situation have an impact on the perceiver similar to those used in the Rorschach cards.

2. The use of regular and irregular presentation sequences requires varying degrees of adjustment to the exposure of colors and is similar to the adaptation required by the shift from achromatic to chromatic cards on the Rorschach test.

If the situations are analogous, we should expect the three groups (representing increasing personality disturbance) to respond in the present situation in a manner predictable from the Rorschach; i.e., the groups should respond differentially to color and to presentation sequence. The present results do not confirm these predictions. The three groups do not respond differentially to color ($C \times Norm$) or to sequence ($Seq \times Norm$), but only when color is varied sequentially do the three groups respond in a significantly different manner ($C \times Seq \times Norm$). This is illustrated graphically in Figure 1. These results suggest either that the present situation is not analogous to the Rorschach test or that it is neither color alone nor the presentation of achromatic and chromatic cards per se but rather the interaction of both of these that produces differential effects. Buker and Williams [3] in discussing the lack of experimental evidence indicating color effects have also pointed out the importance of considering the interaction of color with other Rorschach variables. Our results are in accord with this suggestion.

Finally, it should be noted from Figure 1 that curves for the neurotics appear quite different from those of the other two groups. As the color of the stimulus approaches the warmer end of the spectrum, neurotics seem to show increasing overestimations and thus possibly more defensiveness. Schachtel's suggestion that "nearing the short waved end of the spectrum, the less striking, exciting, stimulating becomes the affective quality of the color" [6, p. 403] seems to be borne out for the neurotic group. This finding is in accord

with the Rorschach hypothesis concerning "color shock" in neurotics.

Summary and Conclusions

Thirty male subjects in three gross personality groupings (control, neurotic, psychotic) were utilized in a size-constancy experiment. The experiment was designed to study the effects of color, presentation sequence, and normality on the size-constancy phenomenon.

The results suggest:

1. There is a different size-constancy index produced by each of the three experimental groups. It is suggested that with increasing personality disturbance there is increasing perceptual defensiveness in terms of overcompensation.

2. In the present experiment it is neither color nor presentation sequence per se which produces differential effects but rather the interaction of these variables. If this situation is analogous to the Rorschach, the implication is that different diagnostic groups show differential reactions not to color alone but to color-sequence effects. In addition there is a suggestion that the neurotics respond to the warm colors quite differently than do the psychotics or the controls.

All in all, the trends shown in the present study suggest that the size-constancy phenomenon may be fruitfully utilized in a study of known clinical groups. Modifications of the present design to eliminate the unimportant variables, together with the use of larger, highly differentiated personality groupings, may permit a better understanding of the problem and allow the results to be better placed in their proper theoretical framework.

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College Student Norms for the Minnesota Multiphasic Personality Inventory[1]

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Several studies have reported norms for the Minnesota Multiphasic Personality Inventory (MMPI) for various groups. The results obtained by several investigators are summarized in Table 2. A glance at this table will reveal that the results presented by these investigators seem to be somewhat in variance with each other.

Purpose

As part of a larger study in which the relationship between personality and emotions is being investigated, it was necessary to administer some sort of personality inventory. The MMPI was decided upon because it was felt that its scales would give the most useful measures of personality for this type of correlation.

Since our sample is large, and since normative data in the literature seem to be somewhat variable, the purpose of this report is to present normative data of college students on the MMPI from a different geographical location and to compare them with a smaller sample from the same location obtained at an earlier time.

Procedure

The booklet form of the MMPI was administered to 533 subjects, 354 men and 179 women, in the fall of 1948. While the majority of the subjects were sophomores at the University of Maine studying general psychology, there were also a number of junior and senior students in the group. Many of the subjects were veterans and therefore the mean age of this group was somewhat higher than that of the usual college group. No distinctions were made as to the college or major in which the students were enrolled. The homes for the vast majority of these subjects were in the state of Maine, the others being in other New England and Middle Atlantic states.

The tests were scored according to the criteria established by the authors of the test. There were 38 men and 13 women who had high scores on the validity scales of ?, *L*, and *F*, and whose tests were discarded. Thus the data here presented are based on 316 males and 166 females. Five of the clinical variables have been corrected with the *K* factor.

Table 1

Range, Mean *T* scores, Standard Deviations, and Percentages with *T* Scores Above 70 on the Scales of the MMPI

Scale	Range in *T* score units	Mean *T* score	*T* score *SD*	% of *T* scores above 70
	Male *N* equals 316			
*Hs**	23–82	53	8.5	3.5
D	20–111	53	12.1	8.5
Hy	33–76	55	7.7	2.2
*Pd**	29–100	55	10.8	10.0
Mf	35–98	59	10.6	13.6
Pa	30–82	50	9.1	1.0
*Pt**	10–103	56	12.8	12.9
*Sc**	10–92	55	12.2	8.5
*Ma**	33–106	60	11.1	14.2
	Female *N* equals 166			
*Hs**	35–82	50	7.8	1.8
D	32–76	49	7.9	1.8
Hy	36–84	54	7.8	4.2
*Pd**	27–93	53	10.4	4.8
Mf	30–80	51	9.5	3.0
Pa	30–76	50	8.2	1.2
*Pt**	21–81	53	9.3	1.8
*Sc**	29–80	55	8.2	4.2
*Ma**	33–93	58	11.0	9.8

*Corrected with the K factor.

[1]This study was supported by a grant from the Coe Research Fund of the University of Maine.

Results

The results as presented in Table 1 show clearly that both male and female subjects fall within the normal range according to the criteria established by the authors of the test. Furthermore, it can be seen that with the exception of hypochondriasis and depression for the women, the scores for these subjects are above *T* scores of 50. It will also be observed that, on the whole, the scores for the women approach *T* scores of 50 more closely than do those for the men. This would seem to indicate that both sexes are normal but the women are more nearly like the original standardization group than are the men.

The curves are not flat. The men's scores are highest on hypomania, masculinity-femininity, and psychasthenia, and lowest on paranoia scales. For the women, on the other hand, the highest scores are on hypomania, schizophrenia, and hysteria, and lowest on depression scales. Of the scales in the "neurotic triad" both sexes score highest on hysteria, with the women scoring lowest on the depression scale and the men obtaining equal scores for the hypochondriasis and depression scales.

As far as the "psychotic triad" is concerned, the results show that the men score highest on the *Pt* scale and the women on the *Sc* scale. However, it is interesting to observe that not only do both sexes score lowest on the *Pa* scale as far as the "psychotic triad" is concerned, but they both give the same score of 50.

Table 1 shows that for the women the standard deviations are in all cases smaller than those of the standardization group used by the authors of the test with the exception of the *Pd* and *Ma* scales. For the men, on the other hand, it can be seen that on six of the nine scales the standard deviations are larger than 10. This again would tend to indicate that, on the whole, our women subjects are like the subjects of the original standardization group while our men subjects are different from the original standardization group.

It can also be seen in Table 1 that some of

Table 2

Means, Standard Deviations, and Number of Subjects for Other Investigators on the Scales of the MMPI

Investigator	Sex	*N*		*Hs*	*D*	*Hy*	*Pd*	*Mf*	*Pa*	*Pt*	*Sc*	*Ma*
McKinley and Hathaway	M	155	Mean	47.44	45.60	51.56	44.76	——	48.11	46.58	47.29	48.54
			SD	5.88	8.85	7.31	9.87	——	7.36	8.08	7.48	10.05
	F	110	Mean	45.41	45.80	49.87	45.68	——	49.46	44.86	47.48	48.04
			SD	8.48	8.11	9.86	8.35	——	7.89	7.76	7.39	10.84
	M	176	Mean	53.70	54.87	56.83	54.87	56.12	53.60	52.43	52.85	58.71
Brown [1]			*SD*	10.33	11.63	9.87	10.33	6.05	10.09	9.61	9.89	10.48
	F	366	Mean	46.69	49.93	52.97	53.84	53.03	52.23	48.25	49.22	54.73
			SD	7.04	8.73	7.71	8.84	9.50	8.48	8.35	7.88	9.60
	F		Mean	44.5	45.8	52.2	48.8	55.1	49.0	46.5	47.9	55.0
Lough [3, 4]	Nurses	61	*SD*	6.07	7.05	6.86	7.89	9.11	8.49	8.28	8.0	9.42
	Liberal		Mean	47.3	48.2	52.5	50.6	52.8	51.7	46.8	48.9	54.6
	Arts	54	*SD*	8.73	8.84	8.31	10.25	10.99	10.99	8.43	8.23	8.92
	Teachers	185	Mean	47.1	48.4	52.7	49.7	50.3	52.2	48.7	51.4	54.6
			SD	7.98	9.42	9.05	11.16	9.25	8.69	9.21	9.27	10.14
	F											
Verniaud [8]	Clerical	40	Mean	46	48	49	49	54	49	49	50	52
	Sales	27	Mean	47	47	50	50	58	45	47	47	52
	Optical	30	Mean	46	48	49	56	55	56	55	54	58
Schmidt [6]	M	98	Mean	48.5	41.2	45.1	47.0	45.2	51.0	49.5	48.5	48.2
			SD	8.2	12.7	10.0	13.1	9.7	8.9	8.4	7.7	9.4
Sopchak [7]	M	78	Mean	52	58	55	57	50	50	58	55	60
			SD	8.7	12.2	8.1	10.1	10.1	8.4	12.1	10.2	8.7
	F	30	Mean	48	51	52	53	49	50	55	54	60
			SD	5.9	9.9	7.4	9.0	10.6	9.0	7.7	5.1	11.9

the subjects scored higher than *T* scores of 70 on some of the scales. Furthermore, it can be seen that a considerably greater percentage of the men subjects score above *T* scores of 70 than of the women subjects. Brown [1] claims that from 3 to 5 per cent of the subjects are expected to exceed *T* scores of 70. Five per cent of the women exceeded 70 only on the *Ma* scale, while at least 5 per cent of the men exceeded this level on all scales except *Hs, Hy,* and *Pa.*

Discussion

The results of other investigators are summarized in Table 2 for purposes of comparison. If the data of this study are compared to Schmidt's normal soldiers, interesting differences are implied. Schmidt's [6] results show that the profiles for his subjects are typically below a *T* score of 50, the lowest point being on depression and the highest on paranoia scales. The data for our men, however, are typically above a *T* score of 50, the highest point being on the hypomania scale and the lowest on paranoia.

Verniaud's [8] data show that her 40 clerical workers approach most closely the level of the standardization group, with a lower hypochondriasis score, while in the present study the *T* scores for our women subjects are higher than either Verniaud's or the original standardization sample. Our women scored lowest on the depression scale and highest on the hypomania scale.

Lough [3], whose sample of female subjects was more adequate, found a fairly level profile at a mean *T* score of about 50 on all scales. She also found that the highest percentage of *T* scores over 70 were on hypomania and in decreasing order of percentage on hysteria, paranoia, psychopathic deviate, and schizophrenia. The present study also reveals that the highest percentage of *T* scores over 70 in decreasing order are on hypomania, psychopathic deviate, schizophrenia, and hysteria. Only a very small percentage (1.2) of our women score above 70 on the paranoia scale while Lough found 4.9 per cent having high scores on that scale.

When we compare our group with Lough's [4] liberal arts group we find, as did Lough, highest *T* score on hypomania, but the lowest on depression while Lough found it to be on psychasthenia.

We find that for both sexes the hysteria score is the highest one in the "neurotic triad" category. This finding is in agreement with Brown [1] who obtained similiar results. For his group the paranoia and hypomania scores were higher than the psychasthenia and schizophrenia scores. The results of the present study are in partial agreement, in that we find the hypomania scores to be higher than the psychasthenia and schizophrenia scores but the paranoia scores the lowest in this group for both sexes. In the "psychotic triad" schizophrenia is the highest score for the women while psychasthenia is the highest score for the men. The male profiles are high on the *Ma* and *Mf* scales while the female profiles are high on the *Ma* and *Sc* scales. For his general college group Brown found that the number expected to equal or exceed a *T* score of 70 exceeded 5 per cent for the females on *Pd, Mf,* and *Ma* scales, and for the males on all the scales. We find that 5 per cent of the women exceed 70 on *Ma,* and approached this figure on *Pd, Sc,* and *Hy,* while the men exceed this limit on all scales except on *Pa, Hy,* and *Hs.*

In an earlier study at the University of Maine on a smaller number of men and women subjects, Sopchak [7] found that his group was normal but gave higher mean *T* scores on the scales than those reported earlier. He also observed that his women subjects approached more closely the mean *T* scores of 50 than the men although the women's scores were somewhat elevated.

The results of the present study indicate that on the whole they are comparable to the earlier results obtained in the same geographical area. In both studies, for both sexes the scores on the hypomania scale are the highest. Also, in both studies both sexes received the same mean *T* score of 50 on the paranoia scale. On the "neurotic triad" in the earlier study the men scored highest on the depression scale while the women scored highest on the hysteria scale. In the present study, however, both sexes score highest on the hysteria member of the "neurotic triad." In the present study the men are high on the masculinity-femininity scale while in the earlier study they scored at a *T* score of 50.

Summary and Conclusions

The group form of the MMPI had been administered to 316 male and 166 female college students. The scores for these subjects were found to be valid according to the three validity scales developed by the authors of the test.

The results permit the following conclusions:

1. The group as a whole is normal according to the criteria of the authors of the test.

2. The women score closer to a *T* score of 50 on the scales than the men do, indicating that the women are more nearly like the standardization group than are the men.

3. The profiles of our normals are not typically below a *T* score of 50 as was found to be the case by several investigators.

4. The curves are not flat. The men's scores are highest on *Ma, Mf,* and *Pt* and lowest on *Pa.* The women's scores are highest on *Ma, Sc,* and *Hy* and lowest on *D.*

5. Both sexes score highest on the hysteria scale of the "neurotic triad" rather than on depression as was found by other investigators.

6. Both sexes score lowest with a *T* score of 50 on the paranoia member of the "psychotic triad."

7. A considerably greater percentage of men than women score above *T* scores of 70. Five per cent of the women exceeded 70 only on the *Ma* scale, while at least 5 per cent of the men exceeded this level on all scales except *Hs, Hy,* and *Pa.*

8. Comparing the results of the present study with those of an earlier one indicates that results obtained in the same geographical area are more nearly alike than those obtained from other regions of the country.

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Examiner Influence on the Rorschach Inquiry[1]

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Several recent studies have been concerned with the influence of numerous forces upon obtained Rorschach psychograms. Hutt [4], Gibby [3], Milton [5], and Pottharst [6] have shown that the "set" of the subject will significantly affect the scores on various Rorschach variables. They have also demonstrated that the scores on certain determinants can be controlled at a conscious and volitional level by the subject. Cleveland [2] and Sanders [8] have shown that certain personal characteristics of the examiner are significantly related to the psychogram which he obtains from his subjects. These studies all show that certain Rorschach variables, rather than being stable, are highly sensitive to the impact of many influences which may be either internal or external to the subject. Some variables are more responsive to the impact of these forces than are others [3, p. 85]. One fundamental conclusion emerges from these different investigations which cannot be overly stressed: Obtained scores on the Rorschach variables cannot be regarded as corresponding solely with the various areas of the subject's personality structure and its functioning. They also seem to vary with the subjects' "set," his interpretation of the examining situation, the stimulus value of the examiner to the subject, the examiner's internal needs and other similar variables. It is felt by the author that obtained Rorschach scores are phenotypic in nature, to the degree that they reflect the latter variables in addition to the source traits of the subject [3, p. 83].

In order to extend our knowledge of examiner influence upon the Rorschach, this study is concerned in particular with the stimulus value of the examiner as it relates to the Rorschach inquiry. Here the examiner has a free rein, being guided in this area of the test administration only by certain broad, unstructured principles. On the free association verbal interaction between examiner and subject concerning the responses is comparatively at a minimum. On the inquiry, however, such interaction is maximal, with the responses of the subject being presumably structured in part according to the questions posed by the examiner. Traditionally the inquiry is conducted in order to clarify the responses made in the free association, so as to elicit the determinants which structured the perception ordered by the subject. If it is true that the Rorschach reflects only the stable personality characteristics of the subject and is not influenced by the stimulus value of the examiner, then changes which occur in the determinants of a response from the free association to the inquiry should not reflect differences which are attributable to the stimulus value of the examiner. If it is not true, then one should expect to find such differences among various examiners. It is presumed that any change in the determinant of a response from the free association to the final scoring is a function of the inquiry which was conducted, although some minor changes may occur due to a spontaneous clarification of responses by the subject. The major question which is posed in the present study is: Do clinicians differ among themselves in the changes which are induced from the free association to the final scoring of Rorschach responses following inquiry?

Subjects and Procedure

In order to explore these hypotheses two experimental groups of subjects were studied.

[1]Published with the permission of the Chief Medical Director, Department of Medicine and Surgery, Veterans Administration, who assumes no responsibilities for the opinions expressed or conclusions drawn by the author.

These are discussed in turn in the following paragraphs.

Experimental Group I. This group was composed of 240 patients at the Veterans Administration Mental Hygiene Clinic, Detroit, Michigan. Each subject was assigned to a Rorschach examiner depending on the day on which he first came to the clinic. No other basis of assignment was utilized. Since the clinic has no policy of scheduling any particular type of patient on any certain day, it was felt that this procedure could be regarded as a random assignment of subjects to an examiner. Twelve examiners were employed, each testing 20 subjects. All examiners had received formal training in the administration and the interpretation of the Rorschach technique. From the standpoint of administration it was felt that all were equally proficient. The examiners were either Veterans Administration clinical psychology staff members or advanced clinical psychology trainees assigned to the Detroit Mental Hygiene Clinic. These Rorschachs were given in a routine manner, with the inquiries structured by each examiner in his customary style. In order that the examiners would not be biased in their inquiries by their knowledge of the experiment, Rorschach records already secured were utilized. The inquiries in this group may be regarded as "Nonstandardized Inquiries."

Experimental Group II. The second experimental group was one in which the inquiries conducted by the examiners were standardized. Data collected by Cleveland [2] and Sanders [8] in their investigations were used for this part of the study.[2] One hundred thirty-five subjects were used, each randomly assigned to one of nine examiners. The subjects in this group were college students taking a course in projective techniques. All examiners had received instruction in the administration of the Rorschach and it was felt that all were equally proficient in its administration. In order to minimize the variance possibly attributable to differences in inquiries, they were standardized by requiring that each examiner routinely ask *only* the following questions about each of the subject's responses:

1. Where in the blot is.....?
2. What about this blot makes it look like.....?
3. What else about this blot makes it look like.....?

If the examiner felt that these questions did not elicit adequate information, he was permitted to inquire further only by saying, "Tell me more about it." The examiners were subjected to a training period prior to the beginning of testing. Cleveland and Sanders observed the first two administrations of the Rorschach by each examiner through one-way screens without the examiner's awareness, to see that all test procedures were correctly carried out. Individual conferences were then held with each examiner in order to discuss the technique of administration. Cleveland and Sanders felt that the inquiry was administered according to their instructions.

Results

The determinants investigated were *F, M, FC, CF, C, FY, Y,* and *V*. The reason for this selection was that it was thought that the location and content categories would show least change from the free association to the inquiry, while these determinants would be most sensitive to such changes. Beck's [1] scoring techiques were used for scoring these variables. Since the *C* and *Y* variables are differentially scored (*FC, CF,* or *C* and *FY, YF,* or *Y*), differences between examiners in the total *C* and total *Y* changes might occur despite lack of change insofar as these refined scorings were concerned. Therefore, differences in the total *C* and *Y* variables were also examined, for total raw *C* and *Y* changes not weighted as in Sum *C* and Sum *Y* scorings. The free-association responses were first scored for each record.[3] Next, the combined free association and inquiries were scored. Each response was thus scored twice, each scoring being done independently. This procedure was followed in both experimental groups. Reliability of scoring for each determinant was then calculated from 27 randomly selected records which were rescored by a second person who

[2] I wish to express my appreciation to Drs. R. Sanders and S. Cleveland for their kind permission to use these Rorschach records.

[3] I wish to express my thanks to Stanley Schneider, V.A. Clinical Psychology Trainee at the Detroit Mental Hygiene Clinic for his valuable help in scoring these Rorschachs and establishing reliabilities.

had previously been trained in the scoring techniques used in the study. (For example it was decided that all responses such as "pointing" should be scored as *M*.)

In order to control the variability introduced by *R*, the number of responses for each determinant in the free-association scoring of each record was converted to a percentage by dividing the number of responses for each of the experimental determinants by the total number of responses in each record. The same procedure was followed for the inquiry scorings. Thus, two percentages were calculated for each determinant, on the free association, and on the free association and inquiry combined. In order to manipulate these percentages statistically, they were then transformed into arcsin. units. The arcsin. of the percentage of each determinant in the combined free association and inquiry was then subtracted from the arcsin. of the percentage of that determinant in the free association for each of the Rorschach records. The difference from free association to inquiry was thus expressed for each determinant in arcsin. units. Distributions of these differences were then calculated for each determinant in the case of each examiner. These were then compared through the analysis of variance technique. The first concern was reliability of scoring. Pearson product-moment correlations between the scoring of the two sections of the Rorschach were computed, following the procedures outlined in the preceding section. These are summarized in Table 1. The relatively low correlations obtained in the cases of the shading determinants may be largely attributable to the extremely low number of responses falling in these categories.

Table 1

Reliability of Scoring of Experimental Determinants

Determinant	On free association	On inquiry
R	1.00	1.00
F	.99	.99
M	.98	.98
FC	.78	.81
CF	.92	.94
C	1.00	1.00
Total *C*	.90	.96
FY	.66	.99
YF	.89	.66
Y	1.00	1.00
Total *Y*	.73	.99
F	.90	.79

Table 2

Significance of Differences Between Examiners In Amount of Change on Each Rorschach Determinant From Free Association to Inquiry

Determinant	Experimental Group 1		Experimental Group 2	
	F	Significance	*F*	Significance
F	2.85	1%	2.78	1%
M	.37	10%	.85	10%
FC	.66	10%	.47	10%
CF	1.69	5%	1.70	5%
C	.62	10%	1.00	10%
Total *C*	7.78	1%	.99	10%
FY	21.04	1%	3.29	1%
YF	1.75	5%	1.80	5%
Y	1.60	5%	—	—
Total *Y*	25.90	1%	2.98	1%
V	.80	10%	1.55	5%

The major hypothesis that there are significant differences between examiners in mean change between free-association scoring and final scoring following inquiry was then tested for each of the experimental Rorschach determinants through the analysis of variance technique. The results are summarized in Table 2 for both experimental groups. From the data presented in Tables 1 and 2 we may formulate the following general conclusion:

Examiners who administer the Rorschach in the usual manner without a standardized inquiry differ among themselves as to changes that occur from the free-association response to the final response following the inquiry. When the inquiry is more controlled through the introduction of a standardized procedure, we find that examiners *still* differ among themselves in regard to these changes.

Discussion

One of the important problems in the application of the Rorschach technique is the determination of the many factors in the testing situation which might contribute to its variance. In the present study we are concerned primarily with the variance which may

be attributed to examiner differences in the inquiry. The data clearly show that examiners *do* differ among themselves in the changes which are induced by the inquiry. It is important to note also that this difference is not limited to one determinant but extends over a number of Rorschach determinants, *F%*, *FY*, Total *C*, and Total *Y*. The results demonstrate that differences may not all be attributed to the particular questions which were posed by the various examiners in their inquiries. When the inquiry was controlled through the introduction of a standard set of inquiry questions, differences between examiners still remained clearly evident. Again it was not limited to one determinant, but extended over a number of the Rorschach determinants. The stimulus value[4] of the examiner therefore must be considered as a factor which influences the inquiry responses of the subject and therefore the final Rorschach psychogram. Standardization of the inquiry does not eliminate examiner differences. This finding leads to several interesting implications which are discussed in the following paragraphs.

The Rorschach psychogram needs to be considered as being a function not only of the characteristics of the subject, but also a function of the characteristics of the examiner. These are expressed in the interaction which occurs at various levels, conscious or unconscious. The particular training of the Rorschach examiner, his "set" toward the subject and his inclinations which are determined possibly by the response pattern of the subject are conceivably forces which all affect the Rorschach inquiry. But above and beyond these still remains the factor of the total stimulus value of the examiner to the patient in the production of the inquiry which determines the final Rorschach psychogram.

When the effects of controlled and noncontrolled inquiries are examined, an important finding emerges. When the inquiry was *not* standardized, the examiners differed amongst themselves in the changes which occured in the *F*, *FY* and Total *Y* and Total *C* determinants. However, when the inquiry *was* standardized the differences still persisted despite the standardization. It is indicated by this that the particular inquiry conducted (the questions posed) influences the production of the color determinant on the inquiry. As compared to the other determinants where differences between examiners were demonstrated, the stimulus value of the examiner, as it affects the total color inquiry, may be considered as minimal. However, insofar as the *F*, *FY*, and Total *Y* responses are concerned, they are maximal. The determinants investigated may be grouped into five major categories:

(*a*). Those in which only form is used (*F*); (*b*) Those in which human movement occurs (*M*); (*c*) Those which utilize color (*FC*, *CF*, *C*, and total *C*); (*d*) Those which utilize shading (*FY*, *Y*, and total *Y*); (*e*) Those which utilize vista (*V*). In both experimental groups no differences between examiners were found in changes in either the movement or vista determinants. Differences in both groups were found in the cases of the form and shading determinants.

It appears that the determinants may thus be differentially ordered in regard to their sensitivity to the various aspects of the stimulus value of the examiner on the Rorschach inquiry. The least sensitive to this influence are the movement and vista responses which apparently do not significantly reflect either differences in the structuring of the inquiry or differences in the stimulus value of the examiner. Next may be placed the color determinants which do not reflect so much the stimulus value of the examiner as they do the actual structuring of the inquiry. Finally at the most sensitive pole we may place the shading and form variables which reflect both the structuring of the inquiry and the stimulus value of the examiner. It is felt that since the *Y* and *F* determinants show such comparatively greater sensitivity, they should be interpreted very cautiously. On the other hand, greater confidence may be placed on the *M* and *V* determinants when considered from this standpoint.

The fact that examiners differ in change

[4]It is recognized that the particular inquiry which is conducted may be a function of the personality characteristics of the examiner. However, for the purposes of this paper, distinction is made between the effects of (*a*) the particular questions posed in the inquiry and (*b*) all other characteristics of the examiner which are grouped under the general term "stimulus value."

from free association to inquiry only on some of the determinants and do not differ in the change in others requires further examination. A specific question which might be raised would be: Why do not the examiners in either of the two experimental groups differ in change in the *M* and *V* determinants? One reason for this lies in the rationale underlying the psychological significance of the *M* and *V* variables. Neither the *M* nor the *V* determinants are actual real aspects of the blot. They have no existence other than within the individual himself, and are ascribed by him to the percept which he orders. The inquiry for these two determinants can be best described as "giving the subject an opportunity to express movement or vista" and is thus limited in its scope. In addition to this, the *M* determinant has further singular characteristics. As Rorschach [7, pp. 23-29] points out, in *M* both form and kinaesthetic engrams are concerned. These, however, are mixed very rapidly in the assimilative process, so that the perceived form and the ascribed motion of that form reach the subjects' perception simultaneously. This together with the limits imposed by the nature of the inquiry for *M* would lessen both: (*a*) The possibility of the subject looking again at the blot and discovering the additional aspect of movement which would be compatible with the response: and (*b*) confusing the original form percept with a speculation of movement stimulated by fusing the original form percept with a speculation of movement stimulated by varying inquiries. Since *M* and *V* are associated with the various aspects of intrapsychic life and not the outside world, they are not as easily influenced either by the stimulus value of the examiner or the inquiry which is posed.

Another question which arises is: Why do examiners differ in change in *C* in the nonstandardized inquiry groups and not in the standardized inquiry group? Apparently *C* in the inquiry is not influenced by the stimulus value of the examiner, but *is* influenced by the questions which are posed. *C* is usually associated with passive receptivity to outer enviornmental stimuli. As Shachtel [8] points out, the response to *C* is immediate, it bursts in and forces itself upon the awareness of the subject. Our findings tend to support this hypothesis. There were no differences in *C* in the standardized inquiry group, the stimulus value of the examiners not either tending to inhibit or to increase the *C* responses in the inquiry. Since, however, the *C* response is so close to awareness, the specific nonstandardized inquiries served to bring to consciousness readily any borderline latent color responses which, as pointed out, lie so close to the surface. For this reason differences were found between examiners when the inquiries were not standardized.

The third question which arises relates to the demonstrated fact that regardless of whether or not the inquiry is standardized, examiners predominately differed among themselves in the changes in the *Y* determinant. The reason for this must be sought in the personality characteristics of the examiner. We may ask, "What characteristics of the examiner operate in the interpersonal relationship of the test situation to produce such changes?" Traditionally the *Y* variable is related to anxiety. Anxieties, particularly those of the free-floating varieties are expressed in one way on the Rorschach through an overconcentration of *Y* responses. What characteristics then of the examiner would tend to produce anxieties within the patient? A very likely hypothesis here would be that examiners who are perceived as being more hostile would tend to produce a larger increment in *Y* than those examiners who are perceived as being less hostile. Hostility, however, may be either latent within the examiner and not perceived by the subject consciously, or it may be overt and consciously perceived by the subject. Both aspects—the overt and covert aspects of examiner hostility—need to be examined. Let us turn to the Sanders study. Here he was concerned with both aspects, and developed reliable and valid measures by which the examiners were ranked according to: (*a*) overt hostilities perceived by the subject: and (*b*) covert hostilities not necessarily perceived by the subject.[5] On the basis of these data the

[5]Overt examiner hostility was measured by Sanders through the use of a questionnaire completed by the subject following the administration of the Rorschach, designed to measure the subjects' feelings toward the examiner. The odd-even reliability of the questionnaire was .72 and the split-half reliability was .89. Covert hostility was measured by first administering a Rorschach to each ex-

examiners in Group 2 (controlled inquiry) were first separated into two groups: (*a*) the three highest examiners in covert hostility and (*b*) the three lowest examiners in covert hostility. The mean changes in *Y* of the high and low examiners in these two groups were then compared through the application of the *t* test. For the covert-hostility variable the difference in mean changes in Total *Y* between the high- and low-examiner groups was not significant below the 10 per cent level. The same grouping was then applied to the examiners when ranked for overt hostilities. For the overt hostility variable the mean change in Total *Y* for the high three examiners was 19.6, with a standard deviation of 8.5. The mean change for the low three examiners was 14.9, with a standard deviation of 7.3. The mean difference was 4.7 and the standard error was 1.7. The *t* was 2.8, which is significant beyond the 1 per cent level. It is concluded, therefore, that the more overtly hostile examiners produce the greatest change in *Y* variables from free association to inquiry. The hostility of the examiner produces anxieties within the subject, who then reacts on the Rorschach by an increased production of shading responses (*Y*). It should be noted that it is *not* the *covert* hostilities that are important, but rather the *perceived* (or overt) hostilities which have greater opportunity for expression during the inquiry. Despite standardization of the inquiry, hostilities may be expressed through gestures, intonation, physiological reactions, and other various expressive movements of the examiner, all of which have greater comparative opportunity for expression in the inquiry.

Summary

The major concern of this research was to determine the influence of the stimulus value of the examiner on the inquiry of the Rorschach test. Two groups of subjects were formed: (*a*) Group 1 was composed of 240 subjects randomly examined by 12 examiners. The inquiries were nonstandardized; (*b*) Group 2 was composed of 135 subjects randomly examined by 9 examiners. These examiners were trained to administer a standardized inquiry.

The general conclusion was reached that examiners who administered the Rorschach without a standardized inquiry differ among themselves as to the changes that occur from the free association to final response following the inquiry. When the inquiry was standardized, differences among examiners still persisted.

The Rorschach determinants may be differentially ordered as to sensitivity to the stimulus value of the examiner on the inquiry. The least sensitive are movement and vista, next color, and at the most sensitive pole are the shading and form determinants. This ordering of sensitivity of determinants was discussed in light of the psychological rationale of the various Rorschach variables.

The differences between examiners in changes in the shading variables were then related to the personality characteristics of the examiners. It was concluded that the more overtly hostile examiners produced the most changes in the shading determinants from free association to final response following inquiry.

The major implication of the study reinforces the findings of other recent studies in emphasizing that obtained scores on the various Rorschach variables cannot be regarded as corresponding solely with the various areas of the subject's personality and its functioning. Besides the subject's "set," his interpretation of the examining situation and other such factors, the stimulus value of the examiner to the subject is also important in the production of the Rorschach psychogram.

aminer. This was then scored for hostility in accordance with Elizur's "Rorschach content test" procedure. The interscorer reliability was .98 [8: pp. 25-32]. Sanders concluded that the hostilities of the examiners significantly affect the obtained Rorschach protocols [8: pp. 74-75].

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Certain Aspects of Wechsler-Bellevue Scatter at Low IQ Levels[1]

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Several studies have appeared in the literature in recent years concerning the subtest scatter patterns of the Wechsler-Bellevue Intelligence Scale. For the most part these have dealt with diagnostic differentials or variations related to age. Hunt and Cofer [4] and Jastak [5] have reviewed this literature; more recent reviews by Rabin and Guertin [7], and by Challman [1] offer further contributions. A few investigators, e.g., Garfield [3], have given attention to IQ level as a factor in Wechsler-Bellevue scatter analysis; French and Hunt [2] have reported intelligence level to be related to scatter on the CVS scale. No report, however, has singularly emphasized intelligence level as a determinant of Wechsler-Bellevue scatter patterns.

The author of the present study has noted in general clinical usage of the scale that certain subtests, notably Object Assembly, and, to a lesser extent, Comprehension, tend to be consistently high in individuals whose scores fall below the average IQ range.

Wechsler [8, p. 97] states: "The Object Assembly was included in our battery only after much hesitation," and, in speaking generally of this type of test, adds, "Most of the standardized formboards are much too easy for the average adult, and at the high levels have very little discriminative value." He reports low correlations between Object Assembly and other subtests and explains this as being "due primarily to the large deviations of a relatively small and seemingly special group of individuals." The "special group" is not identified, though in a following statement he mentions, "This means perhaps that the Object Assembly is a poor test only for certain types of individuals."

The present study was initiated to give a quantitative appraisal of the following hypothesis: In individuals of low intelligence the Object-Assembly and the Comprehension subtest scores tend to be higher than any other Wechsler-Bellevue subtest scores. Additionally, we postulate that the relative height of these two subtest scores is, in large measure, a function of low intelligence level. Statistical tests of significance will employ the null hypothesis, stated as: The number of individuals of low intelligence whose score on the Object-Assembly subtest exceeds their score on *any other* subtest will not differ from chance expectancy. The same conditions are made for Comprehension.

Population

Fifty male outpatients of the Mental Hygiene Clinic, Veterans Administration Regional Office, Little Rock, Arkansas, with Full-Scale Wechsler-Bellevue (Form 1) scores in the range 68-90 IQ (below normal, but above mental deficiency) make up the group investigated. Fifty male outpatients with IQ's above 110 (above normal) comprise a comparison group.

Individuals in both groups are considered by psychiatric diagnosis to be free from frank psychosis or significant organic impairment. Approximately 95 per cent of the patients in each group fall within the category of psychoneurotic disorders, this being the generic term

[1]Reviewed in the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions published by the author are the result of his own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

[2]This paper was presented in part at the meeting of the Rocky Mountain Branch, American Psychological Association, Boulder, Colorado, May, 1952.

used to describe all types of neurotic reactions, such as anxiety, phobic, conversion, somatization reactions, etc. Approximately 4 per cent fall into the classification of character and behavior disorders and about 1 per cent into the category of incipient psychosis or psychosis in remission. This general psychiatric classification is adequate for the purpose of this study since precise diagnostic differentiations are not an issue in the subject under investigation.

The range of ages in the Low IQ Group is 22-41, with a mean of 30.22 years; the range in the High IQ Group is 22-49, with a mean of 31.50 years.

The education level of the two groups is, of course, disparate since individuals of low intelligence are limited in regard to educational achievement. The range for the Low IQ Group in school grades is 3-13, with a mean of 7.48 grades; in the High IQ Group the grade range is 8-16, with a mean of 12.16 grades.

A Full-Scale (eleven-subtest) Wechsler-Bellevue was administered to each patient by either of two psychologists[3] over a period of two years. The 50 most recent records for each group were taken from accumulated files without attempt at selection other than meeting intelligence requirements. The number of individuals in each Wechsler-Bellevue classification is shown in Table 1.

Table 1

Wechsler-Bellevue Intelligence Classifications and Mean Scores for Low and High IQ Groups

Classification	Low IQ Group	High IQ Group
Borderline (68-79)	20	
Dull Normal (80-90)	30	
High Average to Superior (111-119)		29
Superior (120-127)		18
Very Superior (128-135)		3
Verbal-Scale Mean Score	82.68	119.98
Performance Mean Score	81.32	116.60
Full-Scale Mean Score	80.86	119.60

[3]Tests were administered by Dr. Jerome Schiffer, Chief Clinical Psychologist, Mental Hygiene Clinic, Veterans Administration Regional Office, Little Rock, Arkansas, or by the writer, who was formerly at the clinic. The author gratefully acknowledges the assistance of Dr. Schiffer in this study, and his making available clinic records. Acknowledgment is also made for helpful suggestions to Dr. Kenneth R. Hammond, University of Colorado, and to Dr. Vernon W. Lemmon, Washington University.

It will be noted from Table 1 that there are no marked differences between mean Verbal- and Performance-scale scores, with the Verbal score slightly higher in each group.

Procedure and Results

Procedure 1

Weighted scores of Wechsler-Bellevue subtests are used as values for comparison. In order to retain individuality of records, in Procedure 1 scores on each subtest were compared with the mean subtest score for each record. This is essentially the method which a clinician uses when evaluating a single record for subtest scatter. Use of this method for 50 records in each of the two groups avoids a massing or averaging of scores through use of over-all means, which destroys individuality of records and may mask important differences.

Many clinicians [e.g., Wechsler, 8, pp. 152-153] consider three weighted score points above or below a mean score as having significance; this value was used as a cutting score. Accordingly, records for both groups were examined individually, and all subtest scores reaching or exceeding three units above or below the mean for each subject were tallied. Results are shown in Table 2.

Table 2

Frequencies in Subtest Deviations from Individual Means of Three or More Weighted Score Points

Subtest	Low IQ Group		High IQ Group	
	Plus	Minus	Plus	Minus
Information	3	0	4	1
Comprehension	16	0	14	0
Digit Span	1	16	0	22
Arithmetic	4	9	19	0
Similarities	1	1	8	1
Vocabulary	0	1	3	0
Picture Arrangement	3	11	1	8
Picture Completion	3	9	0	2
Block Design	2	1	3	3
Object Assembly	34	0	0	2
Digit Symbol	0	5	0	15

Table 2 shows clearly that certain subtests in each group tend to deviate consistently

Table 3
Object Assembly, Comprehension, and Digit Span Compared with Other Subtest Scores in the Low IQ Group

	Object Assembly				Comprehension				Digit Span			
	Higher than	Tied with	Lower than	*t*	Higher than	Tied with	Lower than	*t*	Lower than	Tied with	Higher than	*t*
Info.	40	7	3	5.23**	38	6	6	4.52**	36	5	9	3.81**
Compr.	27	7	16	1.55					44	3	3	5.79**
D. Span	46	1	3	6.07**	44	3	3	5.79**				
Arith.	44	1	5	5.51**	37	2	11	3.67**	33	7	10	3.22*
Simil.	45	3	2	6.07**	38	5	7	4.38**	39	3	8	4.38**
Vocab.	44	2	4	5.65**	39	4	7	4.52**	37	5	8	4.10**
P. Arr.	45	3	2	6.07**	43	1	6	5.22**	25	9	16	1.27
P. Comp.	45	2	3	5.93**	43	2	5	5.37**	25	16	7	2.26†
Bl. Des.	43	4	3	5.65**	36	5	9	3.81**	36	6	8	3.95**
O. Assy.					16	7	27	−1.55	46	1	3	6.07**
D. Sym.	47	3	0	6.64**	44	2	4	5.65**	25	7	18	.99

**Significant beyond the .001 level.
*Significant beyond the .01 level.
†Significant beyond the .05 level.

above or below mean scores. In the Low IQ Group this is evident particularly for Object Assembly and Comprehension (high scores) and for Digit Span (low score).[4] The consistency is even more marked in consideration of the relative lack of opposite trends in these three subtests.

Procedure 2

Data from Table 2 are not readily adaptable for statistical intragroup comparison of subtests. The frequencies tallied are not independent; two or more deviant subtest scores may be represented in a record. In order to test, for the Low IQ Group, the hypothesis concerning the relative height of Object Assembly and Comprehension, these subtest scores were separately compared with every other subtest in an individual record by the "sign test" of significance, discussed by Johnson [6, p. 80]. This statistic compares the observed percentage of positive differences with the (chance) expected percentage of differences between pairs of scores. Zero differences are counted as one-half the value of positive differences. Thus, the weighted scores on Object Assembly were compared with Information, Digit Span, etc., for each subject in the Low IQ Group, and the number of times in which Object Assembly was higher than or tied with other subtest scores was calculated. The same procedure was used for Comprehension. For those who would have hypothesized that Digit Span would be a low score (because of the presence of anxiety in a group of psychoneurotics), this subtest was also compared in that manner. Results are shown in Table 3.

We note in Table 3 that Object Assembly is significantly higher than any other subtest (at the .001 level) except Comprehension; Object Assembly clearly exceeds Comprehension, but not significantly so. Comprehension is significantly higher (.001 level) than any subtest other than Object Assembly. Digit Span is significantly lower than any subtest other than Picture Arrangement or Digit Symbol, though only at the .05 level when compared with Picture Completion.

Procedure 3

The preceding calculation has involved the Low IQ Group only. Procedure 3, on the other hand, concerns a comparison of High and Low IQ Groups on Object Assembly, Comprehension and Digit Span, using data from Table 2, which are applicable for intergroup comparison. Employing the standard error of the difference between two percentages (using the method of combining percentages), Comprehension and Digit-Span scores

[4]The particular scatter of low intelligence levels only is considered here. In the High IQ Group Comprehension and Arithmetic (high scores) and Digit Span and Digit Symbol (low scores) show interesting deviations.

Table 4
Differences between Low and High IQ Groups for High Scores on Object Assembly

Method	Low IQ Group	High IQ Group	Diff.	σ Diff.	*t*	*p*
a. Object-Assembly score exceeding any other subtest by 1 or more points	(25 of 50) .50	(1 of 50) .02	.48	.088	5.45	<.001
b. Object Assembly exceeding by 2 points or more	(12 of 50) .24	(0 of 50) .00	.24	.065	3.69	<.001
c. Object Assembly exceeding by 3 points or more	(7 of 50) .14	(0 of 50) .00	.14	.051	2.74	<.01
d. Object Assembly equal to or above any other subtest score	(33 of 50) .66	(1 of 50) .02	.64	.095	6.73	<.001

are shown to be nonsignificant between groups —marked trends are in the same direction for both groups. On Comprehension, 16 of 50 cases in the Low IQ Group and 14 of 50 in the High IQ Group show excessive deviations; on Digit Span, 16 of 50 cases in the Low IQ Group are compared with 22 of 50 in the High IQ Group. On the other hand, Object Assembly is significantly higher in the Low IQ Group, at the .001 level. Thirty-four of 50 cases in the Low IQ Group contrast with zero of 50 in the High IQ Group.

Procedure 4

A somewhat different, and at the same time more exacting, comparison for Object Assembly between the two groups—still retaining individuality of records—is to investigate the number of times Object Assembly is the highest subtest score made among the eleven subtests. It will be noted that Object Assembly is not the criterion in this measurement. The criterion is the highest score made among the eleven subtests; Object Assembly has been selected for investigation because of high significance shown in preceding calculations. This method may be used in terms of the frequency with which Object Assembly (*a*) is clearly the topmost score, exceeding any other subtest by one or more weighted score points; (*b*) exceeds any other subtest by two or more points; (*c*) exceeds by three points or more; (*d*) exceeds or equals the score of other subtests. Method (*b*) involves a stringent criterion and Method (*c*) is even more exacting. Table 4 shows the four methods of handling the data, with probabilities again calculated through the standard error of the difference between two percentages.

The remarkable feature demonstrated by Table 4 is the consistency with which the Object-Assembly subtest shows a high comparative value in the Low IQ Group though several measures are used, and in contrast, the lack of such values in the High IQ Group. Object Assembly can be seen at a glance to be highly significant in terms of simple excess (one point or more) over other subtests; when the criterion is placed at two points or more, probability remains at the .001 level, and high significance is maintained ($p<.01$) when three or more points of excess are used.

In summary, these results demonstrate conclusively that the Object-Assembly subtest shows values higher than other subtests in the Low IQ Group, and that it does not show such characteristics in the High IQ Group. This subtest, then, meets all conditions of the hypothesis. Moreover, results show that within the Low IQ Group, Comprehension, in addition to Object Assembly, is a significantly deviant subtest; Comprehension thus fulfills the main condition of the hypothesis—that it tends to be higher than other subtest scores in the Low IQ Group—but since there is no significant difference between groups, it cannot be assumed on the basis of these results that high scores on Comprehension are a function of intellectual level. The same conditions hold for Digit Span as a deviant low score.

Discussion

Though the reasons for deviations in the Low IQ Group may not be immediately apparent, and a single factor probably would not explain the variations, certain factors appear

revelant. Psychiatric diagnoses and age have been kept relatively constant in this investigation, and therefore do not account for the differences between the two groups. Educational level, of course, may influence certain subtests or total score, but the point is made that low IQ often limits the extent of educational progress. Furthermore, in our results there are no marked differences on Object Assembly or Comprehension between those above or below the mean educational level in the Low IQ Group.

We submit that two characteristics of Object Assembly, liberal time allowances and the possibility of trial-and-error solutions, are important in the success of the Low IQ Group. It was observed that many subjects in this group tried pieces of the Profile, for example, at random for a minute or more until they fitted the eye piece correctly, after which they were able to complete the task within time limits. The subtest differs in this respect from a number of others which allow little or no opportunity for trial and error, as Information, Vocabulary, or Digit Span. It differs from other subtests having time limits, as Block Design or Picture Completion, in which trial-and-error solution will not ordinarily achieve the correct answer in the time allotted. Finally, there is the matter of familiarity: All persons, including those of low intelligence, have knowledge of materials used in Object Assembly (Mannikin, Face, Hand). For those reasons particularly, it is suggested that subjects with low IQ's do relatively well on Object Assembly.

The Comprehension subtest seems to allow individuals of low IQ an opportunity to use "common sense." For example, a subject may not know the answer for the author of Hamlet or for the capital of Italy on the Information subtest, but is likely to give creditable replies to many Comprehension questions, which are less specific.

The Digit-Span score was low for both groups. This is in agreement with the widely accepted clinical finding that Digit Span is lowered by the presence of anxiety, and psychiatrically both groups manifest this symptom.

The question of calculation of mental deterioration through "Hold vs. Don't Hold" subtests is relevant. Calculation of the percentage of loss (deterioration) by the Wechsler method, using mean subtest scores, shows a loss for the Low IQ Group of approximately 17 per cent, corrected for average deterioration, age range 30-34. This figure indicates a probability of deterioration. Wechsler [8, p. 66] states: "An individual may be said to show signs of possible deterioration if he shows a greater than a 10 per cent loss, and of definite deterioration if a loss greater than 20 per cent than that allowed for by the normal decline with age." The Object-Assembly subtest alone is sufficient to account for an augmentation in loss from below 10 per cent to above 15 per cent. One must remember that this 17 per cent loss is a *group* figure; chance deviations influence the deterioration percentage more seriously in individual cases. In other words, in an individual of low IQ, one might suspect "definite deterioration," when in actuality the chief factor operating would be a normal Object-Assembly score among other subtests approximating a borderline classification. In the Low IQ Group a loss (deterioration) of 25 per cent or more, in which a significantly high Object-Assembly score was the principal determinant, was not uncommon. Clinical studies did not substantiate such indications of deterioration.

Similar arguments may be advanced with respect to psychopathic personalities, who ordinarily have records in which the Performance-Scale score exceeds the Verbal Scale. A high Object-Assembly score among other lower subtest scores can influence this comparison of scales, particularly in individuals of borderline classification. In the Low IQ Group, in nearly every instance in which the Performance Scale exceeded the Verbal, Object Assembly was the highest subtest score.

Examiners who use an abbreviated scale will readily recognize the potential effects of Object Assembly, Comprehension, and Digit Span in individuals scoring in or below the 70's. Omitting either Object Assembly or Comprehension, or both, can seriously decrease the total score; omitting Digit Span would, on the average, tend to increase the Verbal score in individuals of the type studied.

Finally, we may consider the probability of validity of our results when applied to a general population. In our sample, the Low IQ

Group of neurotics is one in which excessive anxiety is a common feature; therefore, the Digit-Span score may be expected to be low. On the other hand, it would be difficult to explain the comparatively high scores of the Low IQ Group on Object Assembly and Comprehension in terms of diagnostic characteristics. Although there is, of course, no proof offered by this study that "normal" individuals of 68-90 IQ would show similar consistent trends in high scores, the author believes that such would be the case, since the higher scores, particularly for Object Assembly, seem to be a function of a low level of intelligence. Similar studies using records of "normal" subjects would be necessary to substantiate this viewpoint.

Summary and Conclusions

Wechsler-Bellevue records of 50 subjects, approximately 95 per cent of whom are psychiatrically diagnosed as psychoneurotic, with an IQ range of 68-90, were investigated for specific features of subtest scatter. Fifty subjects above 110 IQ, and with similar psychiatric diagnoses and age range, served as a comparison group.

The Object-Assembly subtest in the Low IQ Group was found to be a significantly high subtest score. This is true when a comparison was made between the two groups, or when Object Assembly was compared with other subtest scores within the Low IQ Group. In addition, the Comprehension and Digit-Span subtests showed significant deviations within the Low IQ Group. Possible explanations for these findings, as well as their significance in calculation of mental deterioration and other interpretations of test results for subjects in this IQ range, are discussed.

This investigation calls attention to the influence of intelligence as a determinant of scatter pattern. The present concern was largely with Low IQ Levels, but it is believed that the factor of intelligence level merits consideration in all studies of scatter analysis at all IQ levels. The success of scatter analysis as a diagnostic indicator would be greatly improved with the application of the results of such studies.

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The Validity of Wechsler's Mental Deterioration Index

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In the third edition of his *Measurement of Adult Intelligence,* Wechsler suggested that certain subtests of the Bellevue Adult Intelligence Scale be compared with other subtests in order to determine the extent of possible mental deterioration [18]. The idea of comparing certain test results with others for this purpose was first suggested by Babcock [3]. This same principle was also used in the Shipley-Hartford Retreat Scale [16], and in the Hunt-Minnesota Deterioration Test [8]. The basic theory behind these methods of determining mental deterioration depends on the fact that as people grow older, they decline more rapidly in certain test functions than in others. By comparing any individual's obtained difference in two kinds of functions with the expected difference for his age, the examiner can determine whether the subject has "slipped" more or less than expectation. A case of premature senility would be expected to drop more rapidly in functions that do not "hold" with age than would a normal person, and it is assumed that large differences give the clinician clues about early deterioration.

Soon after the publication of his method, Wechsler and two collaborators stated in reference to the Mental Deterioration Index (MDI), "Further experimentation and statistical refinement is necessary" [11, p. 407].

At the present time we are able to gain perspective about the validity of the MDI. Gutman [7] concluded that the MDI was probably not valid. Kass [10] found the MDI inapplicable for two-thirds of the cases he tested. Schlosser and Kantor [15] discovered that the MDI did not distinguish between psychoneurotics and schizophrenics. Rogers [13] found that the MDI did not differentiate brain-injured people from subjects with functional disorders. Boehm and Sarason [4] stated that the MDI did not distinguish between mental loss and mental deficiency. Sloan [17] found this index not valid with high-grade mental defectives. Allen [1] was able to identify only 54 per cent of brain-injured patients. Garfield and Fey [6] found that an equal number of psychotic and nonpsychotic patients obtained pathologically high deterioration scores with the MDI. Anderson [2] found the MDI of no value in the identification of brain-injured patients. Magaret and Simpson [12] discovered that the MDI did not agree with psychiatrists' ratings of deterioration.

In view of the almost unanimous evidence indicating invalidity of the MDI, it seems inadvisable to continue serious clinical use of this method. The only affirmative support for the MDI seems to come from Wechsler, the originator of the method, whose cross-validating sample was based on only a few cases [11].

Three possible hypotheses come to mind as explanations for the evident clinical failure of the MDI: (*a*) The theoretic basis for the MDI as well as for the other indices may be wrong. A number of writers, especially Magaret and Simpson [12], Garfield and Fey [6], and Rogers [13] consider the concept of "mental deterioration" as being equivocal. Intelligence test score decline patterns due to age alone are not necessarily identical with patterns of abnormal loss. (*b*) The possi-

bility of statistical mishandling of Wechsler's norm data must be considered. Hunt [9] could not agree with Wechsler's division of "Hold—Don't Hold" subtests. Hunt [9] and Allen [1], after they had reanalyzed Wechsler's own data, suggested different combinations of subtests for the purpose of determining mental deterioration. [*c*] Another possible reason for the failure of the MDI is that Wechsler's population is not representative. We shall attempt in this paper to offer more information about the representativeness of Wechsler-Bellevue subtest decline patterns by an analysis of age scores on a large independent population.

Method

The basic method that we shall employ for the re-evaluation of Wechsler's Mental Deterioration Index is an analysis of age curves of certain of the Bellevue subtests, and of selected combinations of subtests. We shall also make use of the 15/50 ratio [5] which compares the equated scores of people in the 50-54 age group to those in the 15-19 age range. A 15/50 ratio of 1.00 would indicate parity; a 15/50 ratio of 2.00 would indicate that the 50-54 year old people do twice as well as the younger people, while a 15/50 ratio of 0.50 would indicate that older people do only half as well as younger people.

We shall transform Wechsler's data into graphs to illustrate the patterns of subtest changes with age and shall do the same with our data for the purpose of comparison; we shall combine the trends of the "Hold" tests and the "Don't Hold" tests for both populations; and, further, we shall contrast the efficiency of the Mental Deterioration Index for both populations versus another index.

Population

The population to be studied is incoming prisoners at San Quentin, who entered between 1944 and 1948. All new men were given routine administrations of this test, with the exception of relatively few men who for emotional, visual, or cultural reasons were deemed unable to take the test. From a total population of over 6000 cases, a sample of 1072 men was selected in the following manner: Starting with the last admission, all people were recorded in twelve five-year age periods, starting with 15-19 and going to 70-74. As soon as 100 cases were obtained in any of these twelve age groups, no further cases were taken in that group. We have been able to get samples of 100 subjects in each of the nine groups from 15-19 through 55-59, and 172 cases beyond the age of 60. This sample is, to our knowledge, the largest reported of older men on the Wechsler-Bellevue.

The question may arise as to the suitability of this population for the purpose of evaluation of the Wechsler Mental Deterioration Index. Prison populations have not been demonstrated to be significantly different from the general population in respect to intelligence, and the preponderance of current opinion supports this view [13]. But even if a prison population cannot be used for normative purposes, it can be used for cross validation for establishing the generality of such indices at the MDI. No one can argue, we believe, that the MDI cannot be used with special populations, since this index is expressly designed for this very purpose.

Before going to results, it may be worth while to speculate on possible findings. If the MDI is valid, then if the prison population is typical of the general population, we should find the same results that Wechsler did. Consequently, if our results agree with Wechsler's, this will be additional evidence for the validity of the MDI. If, on the other hand, our results should not conform with Wechsler's, it is entirely probable, in view of the consensus of independent research studies with abnormal populations, that our norm data are more valid than Wechsler's; that is to say, that our population is truly more representative. This could be proved by additional studies, replicating those quoted above, using whatever our findings will be versus the MDI.

Results

The three sets of graphs in Figure 1 show the age patterns of the "Hold" and "Don't Hold" individual subtests for Wechsler's own data. An inspection of the top four subtests, ("Holds") shows that Information and Comprehension hold well, while Object Assembly and Picture Completion do not hold very well.

The two verbal and the two performance subtests appear to form independent clusters.

The middle portion of Figure 1 shows the age patterns of Wechsler's "Don't Hold" subtests. Although greater conformance is seen, the verbal and performance tests do not operate very similarly, especially at the younger years.

The bottom portion of Figure 1 shows the average age trends of the two groups as a whole. As can be seen, both the "Holds" and the "Don't Holds" drop with increasing age, but the "Don't Hold" combination decreases at a faster rate.

Figure 2 is analagous to Figure 1, but is for the San Quentin data. The reader is asked to compare each of the three pairs of graphs. For the "Holds" the trend seen for Wechsler's data is sharply accentuated. The verbal items start at a low level and go to a higher one; the performance items start at a high level and go to a low one. Information for the San Quentin data improves very sharply, hitting a peak at 55-59 in contrast to Wechsler's peak at 15-19. Picture Completion, on the other hand, shows an equally strong drop. It is evident from the mass of lines seen on the top half of Figure 2 that these four tests are not operating in the same manner. As a matter of fact, none of them can really be said to hold, with the possible exception of Comprehension. Two of the subtests go up and two of them go down. If the concensus were to be "Hold," the "Hold" would still be spurious, since the separate tests do not operate in a parallel fashion.

The middle portion of Figure 2 shows the age trends of the so-called "Don't-Hold" subtests. Although the patterns are not as clear-cut, the same trend seen in the "Hold" tests

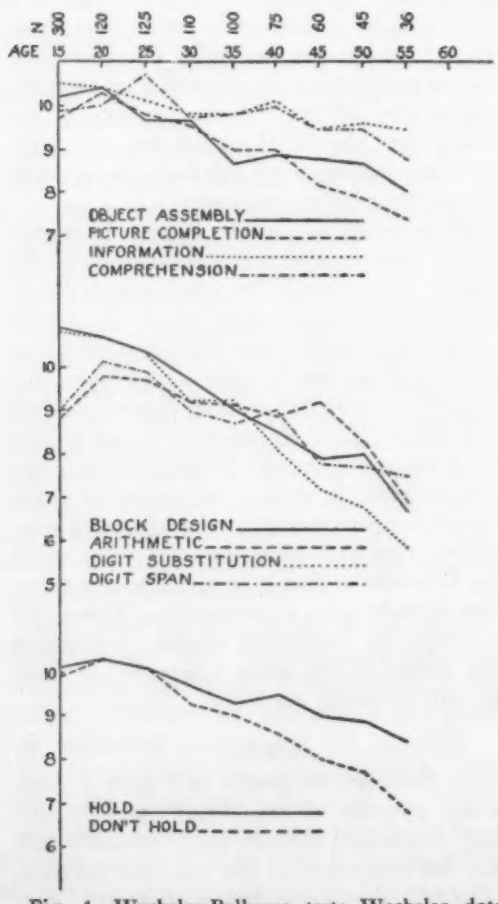

Fig. 1. Wechsler-Bellevue test: Wechsler data. "Hold" and "Don't Hold" scores in relation to age.

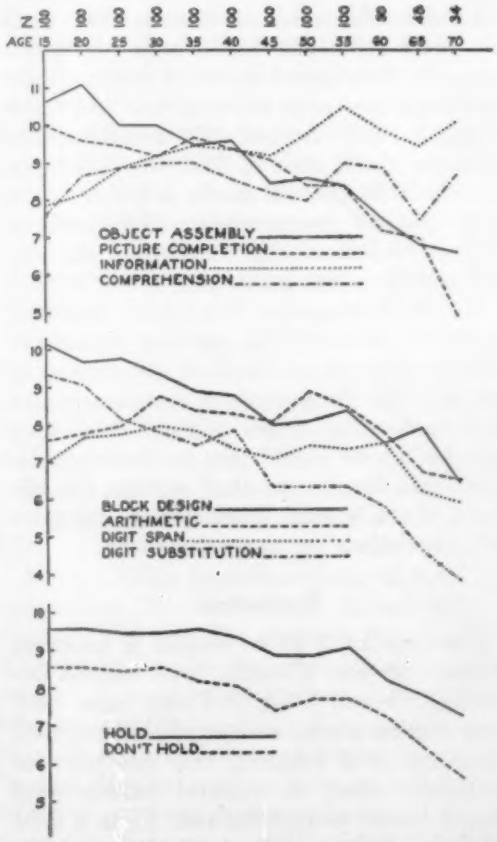

Fig. 2. Wechsler-Bellevue test: San Quentin data. "Hold" and "Don't Hold" scores in relation to age.

is observable: the verbal subtests rise, and the performance subtests fall with age. Digit Span seems to hold most evenly; Digit Symbol Substitution falls most; while Arithmetic shows the greatest increase.

The third portion of Figure 2 is the most remarkable of all, and should be contrasted with the comparable portion of Figure 1. Despite the heterogeneity of the upper two portions of the figure, the two summative trends are identically parallel, and show no difference with respect to age, except that the "Don't Hold" subtests are equally more difficult than the "Hold" subtests at all ages. The divergence of trends seen in the Wechsler data does not exist.

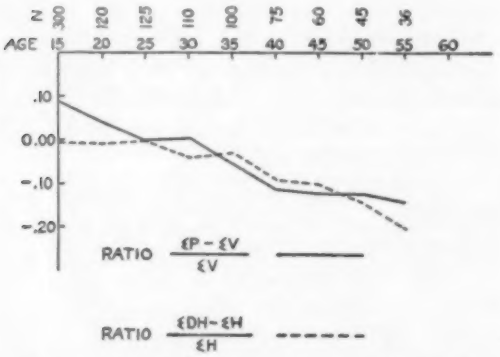

Fig. 3. Wechsler-Bellevue test: Wechsler data. Ratio of "Hold" to "Don't Hold" scores in relation to age.

Figures 3 and 4 are ratio curves, the difference between the two sets of data being divided by one of the sets. Figure 3 shows the trend of decline with respect to age, of both the MDI and of what we may call the Verbal-Performance Ratio (VPR) for Wechsler's data. This latter ratio is obtained simply by subtracting the sum of equated (weighted) verbal scores from that of performance scores, and dividing the result by the sum of the verbal scores. As can be seen, the two curves are roughly identical. It would have been interesting to see further extension of this curve to more advanced ages, but Wechsler's data do not extend past 55-59. On this basis it could be said, in terms of the general trend, that on Wechsler's own data the MDI and the VPR are about equally good—or equally poor—as indicators of mental loss.

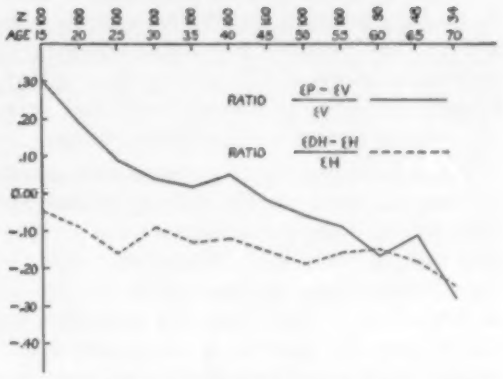

Fig. 4. Wechsler-Bellevue test: San Quentin data. Ratio of "Hold" to "Don't Hold" scores in relation to age.

Figure 4 tells quite a different story, however. The curve of the MDI is fairly constant; in short, in agreement with other investigators who have studied this problem, we find the MDI valueless as an indicator of mental loss, for if the MDI were valid, it would drop sharply with increasing age. But this is exactly what the VPR does with the San Quentin data. In view of the fact that both indices are about equally good for Wechsler's data, and the VPR considerably better on our data, it is our conclusion that the VPR should be considered an index of mental deterioration due to age.

Rank-order correlations on relative rates of decline with respect to age, comparing the Wechsler data ranked by the *t* method as done

Table 1

Rank-order of Rates of Decline of the Wechsler-Bellevue Subtests for the Wechsler and San Quentin Data by the *t* Method and the 15/50 ratio

Subtests	Wechsler Hunt (*t*)	Wechsler 15/50	San Quentin 15/50
Hold			
Information	1	3	1
Comprehension	2	1	4
Object Assembly	4	5	6
Picture Completion	6	6	5
Don't Hold			
Digit Span	5	4	3
Arithmetic	3	2	2
Digit Symbol Substitution	8	8	8
Block Design	7	7	7

by Hunt [9], or by the 15/50 ratio as done by us [5], for both the Wechsler population and the San Quentin population, gives rank-order correlations of 0.99 plus, indicating that, keeping absolute variations out of mind, relative rates of decline are practically identical.

Table 1 shows the rank order of the various subtests in terms of the holding power for both groups. Wechsler's data are analyzed by the *t* method and the 15/50 method, while the San Quentin data are analyzed by the 15/50 method. It is evident from this table that no matter how the analysis is done, nor which population is considered, the verbal tests decline less rapidly than do the performance tests. The median rank-order position in terms of age decline of the "Hold" verbal items is 1.5, of the "Hold" performance is 5.5, of the "Don't Hold" verbal is 3.0, and of the "Don't Hold" performance is 7.5. This indicates that the "Don't Hold" verbal items actually hold better than the "Hold" performance tests.

Discussion

Wechsler admits that performance abilities decline more rapidly than do verbal ones. He says, "For example, most abilities tapped by performance tests decline much more rapidly than those involved in verbal tests" [18, p. 64]. The reason he does not use the VPR is that he believes there must be "functional similarity between opposed or contrasted tests" [18, p. 64]. What Wechsler means by "functional similarity" is not made clear. Whether, for example, Information is considered "functionally similar" to Picture Completion, or Comprehension to Object Assembly, is never made explicit. His argument for not using the most discriminating sets of tests for "holding" and "don't-holding" seems to involve some peculiar reasoning. We shall quote the pertinent section:

> At first thought it might appear that this situation could be capitalized by using verbal tests against performance tests as a ready means of obtaining measures of "Hold vs. Don't Hold" abilities. This, however, would be a mistake because, if we accepted differences between the scores on verbal and performance tests as a criterion of deterioration, all individuals who have relatively good verbal capacity would inevitably show greater mental deterioration as they grew older. This would follow from the fact that the differences between verbal and performance abilities automatically increase with age. On the other hand, people who are relatively good in performance tests would show lesser deterioration or indeed none at all, because the discrepancy between their verbal performance scores would become smaller and smaller as they grew older [18, p. 64].

If the norms of the Wechsler test are so adjusted that the average abilities of large groups of individuals are set at IQ 100, then for any age the particular norms for each of of the subtests are descriptive of the abilities of people as they actually are at that age. Consequently, any individual at any age who shows the patterns of abilities of older ages can be suspected of deterioration. Since we will be making single case diagnoses on the basis of statistical experience, we can expect, lacking longitudinal information on each subject, to be wrong in many cases, but we would hypothesize that we would be wrong less often using the VPR than the MDI.

The differences between our findings and Wechsler's are a function of two kinds of sampling. In view of the large number of cases involved, the differences in many cases undoubtedly exceed the conventional limits of significance. The question arises which sample is the more representative of our total population. Lacking any evidence, we can only point out that the differences can be explained by (*a*) the younger subjects used by Wechsler being actually superior, (*b*) the older subjects used by Wechsler being actually inferior, (*c*) the younger subjects used by us being actually inferior, and (*d*) the older subjects used by us being actually superior. We cannot offer any reasons for (*c*) and (*d*), but we do feel that Weschler's sample [18, Table 11, p. 112] would lead one to believe that most of the younger adults were taken from adult vocational schools and day high schools. These younger adults are almost certainly intellectually superior to their unselected age peers. We have noted that Wechsler reports on only 81 adults over age 50, and since 73 of his adult subjects were taken from old-age institutions, the implication is that practically his entire old sample was taken from such institutions. This would in all probability be considered an extremely unsatisfactory source of

obtaining national norms for an older population, especially in view of the very small sample.

We are particularly impressed by the bottom graph of Figure 1. The consistent rising and falling of the two trends cannot be an accident. From this we conclude that the average of these two sets of subtests selected by Wechsler is absolutely useless in indicating mental deterioration in a penal group, unless one would argue that all age levels in a prison are mentally deteriorated to an equal degree.

We are also impressed by the fact that the VPR is as good an index of decline as the MDI for Wechsler's own population, while it is a far better indicator for the other population.

We should finish this paper by attempting to explain the reasons for these relative rates of decline on the part of older subjects. In our previous paper [5] we explained at some length our conception of the nature of intelligence and why any single test might be a valid indicator of intelligence within a restricted age group but not between age groups. We also believe that intelligence does not decline from early to late maturity, and we believe that no other explanation will account for the good holding of a test such as Digit Span. We can explain improvement in abilities in verbal tests, such as Information, as due to continually accreted knowledge, and it makes good common sense to us to say that people of 50 have more information than people of 15. The decline in performance subtest scores may be a function of (*a*) motivation, (*b*) visual and auditory losses, (*c*) decline in motor coordination, and (*d*) possible cultural differences between younger and older people. These explanations need not be considered as invalidating the concept of mental deterioration, but it does appear that since these are really nonintellectual artifacts, any deterioration index involving possible nonintellectual functions should be used with caution. Wechsler's desire to have an equal number of verbal and performance items is commendable, and would be theoretically preferable, since artifacts will be to some degree cancelled out by this; but, as we have demonstrated, the eight subtests of the Bellevue Test simply do not permit this type of manipulation.

Summary and Conclusions

The validity of Wechsler's Mental Deterioration Index has been studied through the use of a population of adult male San Quentin prisoners, who had been given the Wechsler-Bellevue Test routinely on entrance. Age graphs were made of the different subtests and of combinations of subtests, and younger and older subjects' scores were compared by means of ratios. Wechsler's own population was similarly studied, and the results of the two populations were compared.

On Wechsler's population, the verbal subtests in both "Hold" and "Don't Hold" groups hold with age better than do the performance subtests in either group. The average for the "Hold" group, as well as the average for the "Don't Hold" group, drops with age, but the "Don't Hold" group drops more rapidly.

On the San Quentin population the verbal subtest scores increase with age while the performance scores decline; this is true within both "Hold" and "Don't Hold" groups. The summative trends for these two groups are parallel; the "Don't-Holds" being uniformly more difficult with age than the "Holds" but showing no greater decrease with age than does the "Hold" group.

When evaluated by means of ratios (the difference between two groups of scores being divided by one of the groups), it is found that the comparison of all verbal to all performance tests (VPR) is about as good as the MDI on Wechsler's population as an indicator of mental loss. On the San Quentin population the VPR is much better in this respect than the MDI. Rank-order correlations regarding degree of drop, the ranking being done by both the *t* method and by the 15/50 ratio, indicate that the relative rate of drop of the various subtests is approximately the same for both groups.

There is no evidence that a prison population is not representative of the general population with respect to intelligence. But even if this is not so, there is no reason why a prison population cannot be used for validation in respect to between-age comparisons. The San Quentin population is considerably larger than Wechsler's at the older ages, and, we believe, selected with less bias.

The general conclusion of this study is that serious clinical use of Wechsler's Mental Deterioration Index should be discontinued, and that other indices such as the VPR be evaluated for clinical usefulness.

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Deviations of Wechsler-Bellevue Subtest Scores from Vocabulary Level in University Counseling-Center Clients

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In agreement with Estes [3], evidence is presented here that the use of patterns of deviations of subtest scores from vocabulary level on the W-B as an aid in the diagnosis of personality disorders is a problematic one with above-average and superior adults. Estes' data and the following material tend to support the hypothesis that a pattern of scatter is "normal" in groups of above-average and superior adults. The deviation scores of Rapaport's [6] Kansas patrolmen support this hypothesis even though Rapaport attempted to explain away the scatter pattern.

Rapaport has made the most extensive use of subtest-score patterns as distinctive for each of a variety of personality disorders. His descriptions of 217 Menninger clinic cases show that his *S*s had a superior educational and socioeconomic status and probably had IQ's in the high-average to very superior ranges prior to their illnesses. Thus it is of interest to compare relatively normal groups of superior or above-average adults in regard to subtest scatter patterns.

Wechsler [7] and others following Rapaport have made much use of deviations of individual's W-B subtest scores in the determination of scatter patterns for clinical groups. This approach was stimulated by the method of construction of the W-B. Since the raw scores of the 20-34 age group on each of the ten original subtests were translated into standard scores with a mean of ten and a standard deviation of three, the various subtests could be compared directly with each other. This practice rests heavily on the assumption that in a well-adjusted person there should be little discrepancy among the subtest scores. As Estes has pointed out, the use of this approach overlooks the fact that what holds true for an entire group may not hold for subgroups and may be highly questionable for individuals. Such an assumption implies that the abilities measured by the various subtests are very highly correlated. Neither a factor-analysis study [1] nor Wechsler's subtest intercorrelations support this assumption.

In this study the W-B scatter patterns of three groups of *S*s of above-average and superior ability are compared. Estes has previously compared the scatter pattern of a group of

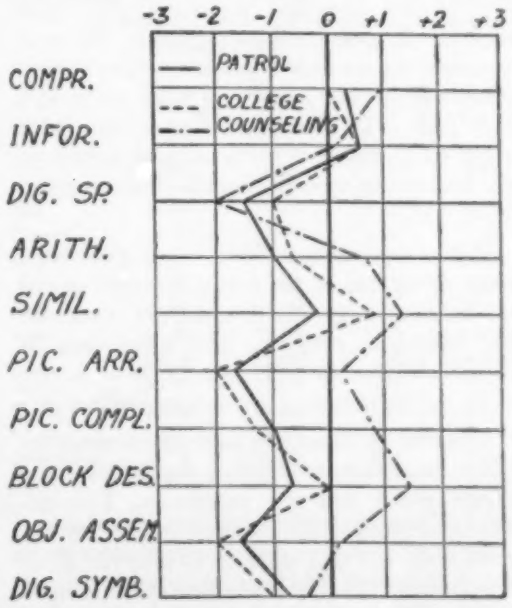

Fig. 1. Mean Deviations of W-B Subtest Scores from Vocabulary Level for Kansas Patrolmen (N= 54), Harvard College (N =102), and Counseling-Center Client (N=429) Groups.

Table 1

Deviations of W-B Subtest Scores from Vocabulary Level for the Kansas Patrolmen, Harvard College, and Counseling-Center Client Groups

Subtest	Mean Deviation			Range of Deviation		
	Kansas Patrol. (N=54)	Harvard College (N=102)	C. C. Clients (N=429)	Kansas Patrol. (N=54)	Harvard College (N=102)	C. C. Clients (N=429)
Inf.	+.28*	+0.4	+.71	−3 to +5	−4 to +5	−3 to +5
Comp.	+.18	0.0	+.24	−4 to +5	−6 to +5	−6 to +6
Digits	−1.44	−1.0	−1.97	−8 to +7	−9 to +5	−9 to +5
Arith.	−.96	−0.7	+.84	−6 to +7	−6 to +4	−7 to +8
Sim.	−.30	+0.7	+1.22	−4 to +4	−4 to +5	−5 to +7
P. A.	−1.89	−2.0	+.01	−7 to +5	−8 to +3	−8 to +8
P. C.	−.98	−1.4	+.64	−6 to +4	−7 to +4	−5 to +7
B. D.	−.67	0.0	+1.59	−6 to +4	−8 to +5	−6 to +11
O. A.	−1.78	−2.0	+.29	−9 to +4	−8 to +3	−8 to +6
Dig. Sym.	−.87	−1.0	−.33	−7 to +4	−7 to +4	−7 to +7

*Plus = Subtest above Voc.; Minus = Subtest below Voc.

Harvard students with Rapaport's control group. Estes' 102 volunteers had mean IQ's of 128, 119, and 127 on the Verbal, Performance, and Full Scales, respectively, of the W-B. Rapaport's 54 Kansas patrolmen had mean IQ's of 115, 114, and 116 on the same three scales. The group for this study, 429[1] of 450 university counseling-center male student clients described elsewhere [5], falls between the two previous groups in ability as measured by the W-B; their mean Verbal, Performance, and Full-Scale IQ's were 119, 119, and 121. The counseling-center group seems to represent a fairly normal sample of the University of Washington student population [5].

Figure 1 presents for these three groups the mean deviations of the scores for each of the ten subtests from the Vocabulary scores of the individual subjects. The same data in numerical form, as well as the range of scatter of the subtest scores, are given in Table 1.

As noted by Estes, the patterns of mean deviation scores are very similar for the Harvard college group and the patrolmen. This resemblance is especially striking in view of the educational and IQ differences between these two groups. The counseling-center group is similar to these two groups on Comprehension, Information, Digit Span, and Digit Symbol but quite different from them on Arithmetic, Picture Arrangement, Picture Completion, Block Design, and Object Assembly. In the counseling-center group the latter subtests tend to be higher than Vocabulary rather than below Vocabulary as in the other studies. That this difference is not related to the client status of the *S*s is indicated by the results obtained on 274[2] of 280 nonclient volunteer male students described elsewhere [5]. The pattern of subtest scores for this nonclient volunteer group is almost identical with that of the client group; the rank-order correlation between the mean deviations for these two groups is .99.

There is evidence to show that University of Washington students have a vocabulary level below that of many university students. On the Vocabulary section of the Cooperative English Test, Form OM, the 25th, 51st, and 75th centiles for entering freshmen at Washington correspond to the 3rd, 8th, and 19th centiles on national norms for freshmen in preprofessional colleges and to the 12th, 27th, and 45th centiles on national norms for freshmen at liberal arts colleges. Washington freshmen do not, however, have less general verbal ability as measured by the ACE than most university freshmen. On the Linguistic Scale of the 1949 ACE the 24th, 49th, and 75th local freshmen centiles correspond to the 30th, 49th, and 77th national freshmen centiles. Thus it would appear that one of the factors

[1]Vocabulary was not given to 21 of the 450 *S*s.

[2]Vocabulary was not given to six of the 280 *S*s.

Table 2

Percentages of Kansas Patrolmen, Harvard College, and Counseling-Center Client Groups Who Varied 3 or More Points from Vocabulary Level on the W-B Subtests

Subtest	Deviations of −3 or More			Deviations of +3 or More			Deviations of ±3 or more		
	Kansas Patrol.	Harvard College	C. C. Clients	Kansas Patrol.	Harvard College	C. C Clients	Kansas Patrol	Harvard College	C. C. Clients
Inf.	5.6	4.9	2.3	1.8	2.0	11.6	7.4	6.9	14.0
Comp.	9.3	15.7	7.0	13.0	11.8	13.7	22.2	27.4	20.7
Digits	38.9	34.3	44.0	11.1	14.7	8.6	50.0	49.0	52.6
Arith.	29.6	28.4	15.1	9.3	17.6	31.2	38.9	46.1	46.3
Sim.	13.0	2.9	3.3	3.7	9.8	25.6	16.7	12.7	28.8
P. A.	37.0	44.1	20.2	3.7	1.0	19.5	40.7	45.1	39.8
P. C.	24.1	26.5	7.0	3.7	2.9	14.9	27.8	29.4	21.9
B. D.	18.5	15.7	5.4	7.4	13.7	37.2	25.9	29.4	42.6
O. A.	40.7	36.3	11.4	3.7	1.0	17.7	44.4	37.2	29.1
Dig. Sym.	24.1	30.4	19.5	9.3	6.9	14.4	33.3	37.2	34.0
Ave. %	24.1	23.9	13.5	6.7	8.1	19.4	30.7	32.0	33.0

contributing to the differing scatter pattern of the counseling-center client group would be the generally lower vocabulary level of students at this university.

According to Wechsler, deviations of three or four points from the mean subtest score would be "significant" for *S*s of above-average or superior ability. Using Vocabulary rather than the mean weighted score as the reference point, Table 2 presents the percentage of *S*s in the three groups who show possibly "significant" deviations. From these data it is evident that large deviations from Vocabulary occur far too frequently in all three groups to be diagnostically significant. Moreover, although the usual range between the highest and lowest weighted scores of an individual is about seven points, a range as great as ten or more weighted scores is not rare. It occurs in 11.2 per cent of the counseling-center group, 9.8 per cent of the nonclient volunteer group, and 9.3 per cent of Rapaport's patrolmen.

The data also indicate, as have reliability studies [2], that the same "rule of thumb" regarding what constitutes a significant deviation cannot be applied equally to all subtests. All three of the studies reported here show that large deviations, from Vocabulary at least, are especially common on Arithmetic, Digit Span, and Picture Arrangement. This is further illustrated by the data in Table 3 which gives the means and standard deviations of subtest scores for the counseling-center clients and the nonclient volunteers; the rank-order correlations between the means and between the standard deviations for the two groups are .91 and .93, respectively. As might be expected from Table 2, group performance is particularly variable on Arithmetic, Digit Span, and Picture Arrangement. These three subtests are also the most variable ones in Gerboth's [4] study on college students.

Table 3

Means and Standard Deviations of W-B Subtests for Counseling-Center Client (N=429) and Volunteer (N=274) Groups

Subtest	Mean Weighted Score		*SD* Weighted Score	
	Clients	Volunteers	Clients	Volunteers
Inf.	13.03	13.35	1.54	1.61
Comp.	12.56	12.74	1.88	1.88
Digits	10.37	11.25	3.03	3.19
Arith.	13.17	13.62	3.17	3.23
Sim.	13.53	14.07	2.18	2.07
Voc.	12.32	12.84	1.59	1.52
P. A.	12.34	12.30	2.69	2.86
P. C.	12.96	12.96	1.66	1.46
B. D.	13.91	14.03	2.15	2.04
O. A.	12.62	12.58	2.27	2.19
Dig. Sym.	11.98	12.26	2.01	2.06

In view of the obtained scatter patterns for above-average and superior *S*s, one may question the assumption made by Rapaport that a well-adjusted person should have little deviation from vocabulary level in his subtest scores. Although correction for "normal" scatter cannot be made in a quantified way, consideration should be given to the evidence that consider-

able scatter is to be expected. It follows that the use of patterns of deviations of subtest scores from vocabulary level as aids in differential diagnosis of personality disorders with above-average and superior adults is a questionable procedure. Clinical interpretations of such discrepancies as evidence of maladjustment or impairment need considerable support from other tests and measurements.

Summary

Data based on 429 university counseling-center male student clients were presented to evaluate the use of patterns of deviations of subtest scores from vocabulary level on the W-B as an aid in the diagnosis of personality disorders. The data, like Estes', question such usage and demonstrate that scatter is to be expected in groups of above-average or superior adults. An analysis of both individual variability relative to vocabulary level and of group variability on the various subtests indicates that some subtests, i.e., Arithmetic, Digit Span, and Picture Arrangement, may be expected to produce more scatter than others. This finding further supports the inadvisability of attributing diagnostic significance to an individual's subtest-score deviations on the W-B without supporting evidence from other tests and measurements.

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A Note on the Intercard Reliability of the Thematic Apperception Test

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As part of a classroom demonstration a study was conducted of the consistency with which the personality of the storyteller is reflected from card to card on the TAT. It was hypothesized that the nature of a story is determined in part by the stimulus value of the specific card and in part by the personal projections of the storyteller, but that the personality of the storyteller could be recognized to an above-chance degree from card to card.

Stories to five popularly used cards in the 1943 Harvard series, 1, 3BM, 4, 7BM, 13MF, were selected from those told by 20 outpatients, drawn from the Washington University Clinic files—a total of one hundred stories. The sample was restricted to white males between the ages of 20 and 29 with Wechsler-Bellevue IQ's above 90 but randomly selected from that group. The one hundred stories were typed separately in uniform fashion on 5 x 8 cards, identified only as to the picture stimulus, by card number. The stories from each TAT card were arranged in four groups of five stories each, according to the general length of the stories, such that there was one group of relatively long stories for each TAT card, one of medium length, and two groups of short stories (referred to below as S_1 and S_2). A matching experiment was designed in which the stories from each card were paired in the groups of five with those from each of the other cards, holding the length of the stories constant (Table 1). This design called for 16 matches for each story, a total of 40 matches. Eight different freshmen medical students acted as matching judges. Unfortunately the number of matchings per judge could not be held constant and the recording of the identity of the judges was imperfect. Thus no direct data are available on the comparative reliability of judgments.

Table 1

Number of Successes per Matching Group

Card	Card 3BM	4	7BM	13MF
1	2 1*	5 0	5 1	1 3
	1 1	3 5	3 1	1 1
3BM		5 3	5 1	3 3
		3 3	0 3	2 1
4			3 0	1 3
			3 3	3 1
7BM				3 0
				3 3

*In each square of numerals, the left and right upper numbers represent the successes in the Long and Medium stories, and the two lower numbers represent the successes in the two groups of Short stories, S_1 and S_2.

Results of the matchings are given in Table 1. Using Vernon's [1] nomograph, his coefficient of contingency for a 5 x 5 matching was determined. The matchings shown in the table can be evaluated as follows:

5 successes (S equals 1.00) C equals .895 ±.007
3 successes (S equals .60) C equals .710 ±.071
2 successes (S equals .40) C equals .450 ±.142

At least 22 of the 40 matchings were successful to a degree considerably above chance (3 successes or more). The over-all degree of success, S, equals .595, C equals .70 ± .070. Card 4 evidently contributed most heavily to the matching success with 12 matches of 3 or more successes; Card 7BM was next with 10 such significant matches; Cards 3BM and 13 MF were equally difficult to match, with 8 significant matchings each; Card 1 was the most difficult to match to the other stories,

only 6 of the 16 matchings to this card reaching a *C* of .710 or greater. As might be expected, the longer stories tended to be matched with a slightly greater degree of success.

It may be concluded that the hypothesis stated above was borne out, that the idiosyncratic contribution of the storyteller can be identified from card to card, even by untrained judges. This study, albeit cursory and gross in design, lends credence to the clinically accepted intercard consistency or reliability of the TAT. The results for the five cards selected here suggest, however, that this reliability may vary considerably from picture to picture and indicates the need for a more comprehensive and refined study.

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NEW BOOKS AND TESTS

Books

Ausubel, David P. *Ego development and the personality disorders.* New York: Grune & Stratton, 1952. Pp. xviii + 564. $10.00.

Ausubel presents a theory of psychopathology based on a knowledge of child development. He feels that behavior disorders are largely the outcome of unfavorable situations during the period of ego development. He rejects the Freudian explanation of psychopathology as having too narrow a base and feels that the most important determinants of future personality structure are found "in the changing aspects of the child-parent, and child-society relationship through the successive stages of maturation." The book does not deal with psychopathology primarily but presents its phenomena in relation to the theory of ego development. Unusual in a book of this nature is a chapter on the development of conscience. Dr. Ausubel feels that the psychotherapist cannot ignore the question of moral growth and must of necessity come to grips with problems of ethics. The book is well organized and contains an excellent bibliography and index. Even if the reader does not always agree with the author's statements he will still find them challenging and thought provoking.—*B. M. L.*

Barlow, Fred. *Mental prodigies.* New York: Philosophical Library, 1952. Pp. 256. $4.75.

A strange but entertaining book which contains a miscellany of anecdotes about historic prodigies—lightning calculators, chess prodigies, famous memorizers, and the like. The approach is entirely prescientific, with no mention of psychological measurements or experiments. Terman's name is not in the index. A concluding section on "mental magic" shows how you, too, can become a mental prodigy. —*L. F. S.*

Brunswik, Egon. *The conceptual framework of psychology.* International Encyclopedia of Unified Science, Vol. I, No. 10. Chicago: University of Chicago Press, 1952. Pp. iv + 102. $2.00.

This is the tenth monograph of a series on the Foundations of the Unity of Science intended to aid the integration of scientific knowledge from different fields. Frequent reference is made to the earlier numbers which have discussed mathematics, physics, biology, cosmology, linguistics, etc. Brunswik conceives that the two major problems of psychology in becoming a scientific discipline were the development of a methodology comparable to those of other sciences, and the finding of means to make its investigations on an adequate level of complexity. He discusses these two problems, and the inadequacies of the solutions offered by various psychological systems. He feels that present trends are converging towards an objective functional approach which should prove adequate.—*A. R.*

Ferguson, Leonard W. *Personality measurement.* New York: McGraw-Hill, 1952. Pp. xv + 457. $6.00.

A comprehensive survey of personality tests which emphasizes the concepts and methods basic to their construction. The book is organized around fourteen approaches to measurement—empirical, rational, multidimensional, perceptual, experimental, to name only a few—each of which is illustrated by research data concerning the construction of an important test. In two chapters, for example, the Strong and Kuder methods of interest measurement are described at length and are contrasted as illustrations of mainly empirical and rational techniques. The book is deceptively simple. Its language structure gives a first impression of being almost too much in "words of one syllable," and statistical complexities are omitted. Beneath the apparent simplicity, however, the author comes to grips with many really complicated issues of technique, but communicates them with remarkable clarity. Elementary students can use the book, and quite advanced students will still find much of profit in it.—*L. F. S.*

Humphrey, George. *Thinking: an introduction to its experimental psychology.* London: Methuen, and New York: Wiley, 1951. Pp. xi + 331. $4.50.

This volume represents a systematic presentation and analysis of the experimental studies of "thought processes." The author begins by reviewing the position of British associationists and notes that conditional reflex theory represents an experimental or behavioristic parallel. He next devotes three chapters to an exposition and defense of the work of the Wurzburg school. This is followed by an evaluation of the contributions of Seltz and of the Ge-

Note: The reviews were prepared by the Editor and the Associate Editors, who may be identified by their initials.

stalt school. The last three chapters review the experimental studies of thinking as related to muscular activity, to language and to generalization. This is a scholarly work and includes a selected bibliography of over 300 titles.—*E. L. K.*

Roback, A. A. *History of American psychology.* New York: Library Publishers, 1952. Pp. xiv + 426. $6.00.

American psychology did not begin with William James and the first psychological laboratories, but had significant roots in the eighteenth and nineteenth centuries. To modern psychologists, often ignorant of their own intellectual ancestors, Roback's *History* supplies an opportunity to become acquainted with the remarkable Frederick Rauch who authored the first American *Psychology* in 1840, and with James McCosh, Laurens P. Hickok, and other early giants. Roback is at his best when dealing with the earlier periods. When he approaches the contemporary scene, he reveals his own prejudices too overtly, especially his distaste for behaviorism. The pioneer days of dynamic and psychoanalytic psychology in America are presented extensively and sympathetically. Judged as a history, the book has mixed merits. Original sources are quoted at length, the twenty-eight illustrations are good, and there are thorough indexes of names and subjects. On the other hand, the footnote documentation is often incomplete, and the book lacks a general bibliography. In at least one instance, authors with similar names are confused. The volume is readable and informative, but is by no means a perfect example of historical research.—*L. F. S.*

Shostrom, Everett L., & Brammer, Lawrence M. *The dynamics of the counseling process.* New York: Mc-Graw-Hill, 1952. Pp. xv + 213. $3.50.

This is a brief (165 pages and appendices) discussion of counseling used effectively in a student personnel program. The procedures of this eclectic and dynamic approach, called self-adjustive by the authors, are presented as applicable to a broad scope of difficulties. Most of the discussion implies the frequent use of tests and an emphasis on vocational and educational problems. There is little specific discussion of counseling related to study habits and skills. The client-centered approach (reflection and acceptance of feelings) is integrated into a procedure which motivates the student to acquire and assimilate the facts necessary to make a better adjustment. Useful forms from the Stanford Center are included to illustrate specific methods. The authors correctly state that the book fulfills the need for a how-to-do-it-approach particularly in the area discussed. It might be questioned whether the title describes the major content of the book, even though specific counseling procedures are placed in a framework of learning and self-perception. This emphasis is well needed in educational counseling. The reviewer believes even more space might have been devoted to needs, barriers to satisfactions, anxieties, and inadequate defenses—the *dynamics* of adjustment as seen and handled in the educational counseling situation.—*F. McK.*

Tests

Cassel, Russell N. *Cassel Group Level of Aspiration Test.* Grade 5-adult. 1 form. 6 (40) min. Test booklets ($3.00 per 25); Manual, pp. 24 (75¢); Specimen, 10 booklets and manual ($2.00). Beverly Hills, Calif.: Western Psychological Services, 1952.

The Cassel material for the level-of-aspiration experiment is based on 12 repetitions of a simple motor task, each requiring 30 seconds. The subject states his aspirations before each trial and determines his own performance after it. The usual discrepancy scores are obtained, and a number of other scores. The manual gives standard directions for administration and much statistical data. The discrepancy scores have reliability from .63 to .82 in various groups. Norms are based on 1,000 cases, but the normative sample is not described except for the statement that "more than half" are institutionalized. Data show that the *D* scores differentiate significantly between high-school pupils and institutionalized delinquents, and a good expectancy table shows the discriminations obtained with various cut-off scores. The author may be commended for standardizing a useful but hitherto unstandardized technique, and for publishing such relatively full data about it. At the present time, however, our knowledge of the level-of-aspiration experiment by no means justifies all of the clinical implications that Cassel seems to draw from some of his scores. The test is a good instrument for further research, not a finished clinical tool.—*L. F. S.*

Jolles, Isaac. *A catalogue for the qualitative interpretation of the H-P-T.* Manual, pp. 97 ($2.00). Beverly Hills, Calif.: Western Psychological Services, 1952.

This is a cookbook if there ever was one. The *Catalogue* consists of an alphabetical list of aspects of House-Person-Tree drawings with the psychological interpretation of each. A sample is: "*Clouds*—Generalized anxiety referred to situation represented by whole with which drawn." Such an inventory would be justified only if each item were accompanied by a reference to a research demonstrating the validity of the inference. No such studies are cited, nor do they exist for the greater part of the proposed interpretations. In its present form this *Catalogue* represents a real danger to scientific progress in clinical psychology.—*L. F. S.*

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